

## Installation, Start-Up and Service Instructions

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### SAFETY CONSIDERATIONS

Installation and servicing of this unit can be hazardous due to system pressure, electrical components and equipment location (such as a ceiling or elevated structure). Untrained personnel can perform the basic maintenance functions of replacing filters. Only trained and qualified service personnel should perform all other operations.

When installing this unit, observe precautions in the literature, tags and labels attached to the equipment, and any other safety precautions that may apply.

- Follow all safety codes.
- Wear safety glasses and work gloves.
- Use care in handling and installing this unit and any accessories.
- Use quenching cloth for all brazing operations.
- Have fire extinguisher available for all brazing operations.

### ⚠ WARNING

Before performing service or maintenance operations, turn off main power switch to the unit. Electrical shock could cause personal injury.

### ⚠ CAUTION

Sharp edges, coil surfaces and rotating fans are a potential injury hazard - avoid contact.

### INTRODUCTION

This document contains general installation instructions for the 40UV,UH unit ventilators. Refer to the unit wiring diagram or to specific manufacturer literature for any other type of factory-mounted controls.

See submittal drawings for unit configurations, dimensions, clearances, and pipe connections. Refer to unit wiring label for all electrical connections; follow NEC (National Electrical Code) and local codes.

### PREINSTALLATION

**Unpack and Inspect Units** — Immediately inspect each unit upon receipt. Remove shipping wraps from all units. Check the shipment against shipping order. *If shipment is damaged or incomplete, file claim with transportation company and advise Carrier immediately.*

To prevent handling damage, remove shipping pallet only when within a few feet of final position. Use 2 or more pallet dollies to move units. See Fig. 1.

### ⚠ CAUTION

To prevent handling damage, remove pallet only when within a few feet of final position.

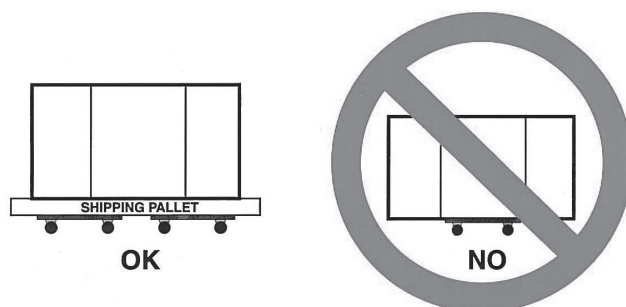


Fig. 1 — Handling the Unit

**Protect Units from Damage** — To maintain warranty, protect units against adverse weather, theft, vandalism, and debris on the jobsite. Do not allow foreign material to fall into drain pan. Prevent dust and debris from being deposited on motor and fan wheels.

If the equipment is stored for any length of time before installation, it should remain in its shipping container in a clean, dry, and climate controlled area.

**Prepare Jobsite for Unit Installation** — To save time and to reduce the possibility of costly errors, set up a complete sample installation in a typical room at jobsite. Check all critical dimensions such as pipe, wire, and duct connection requirements. Refer to job drawings and product dimension

drawings as required. Confirm that building construction is adequate to support the unit. See Table 1 for unit weight data. Instruct all trades in their part of the installation.

### Identify and Prepare Units

1. Be sure power requirements match available power source. Refer to the unit nameplate and wiring diagram.
2. Remove front (40UV) or bottom (40UH) access panels from the unit. Retain the  $\frac{5}{32}$ -in. socket head fasteners and panels for reinstallation later.
3. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for shipping damage and fan obstructions.

**Table 1 — Physical Data**

| UNIT 40UV,UH  | 050*                               | 075                                | 100                                | 125                                | 150                                | 200†                               |
|---|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| <b>NOMINAL AIRFLOW (Cfm)</b>                            | 500                                | 750                                | 1000                               | 1250                               | 1500                               | 2000                               |
| <b>FANS</b>   |                                    |                                    |                                    |                                    |                                    |                                    |
| Quantity  | 1                                  | 2                                  | 3                                  | 4                                  | 5                                  | 5                                  |
| Diameter (in.)  | 8.32                               | 8.32                               | 8.32                               | 8.32                               | 8.32                               | 9.5                                |
| Width (in.)   | 8                                  | 8                                  | 8                                  | 8                                  | 8                                  | 6                                  |
| <b>40UV FILTERS</b>                                     |                                    |                                    |                                    |                                    |                                    |                                    |
| Nominal Size (in.) (1 in. thick)                        | 9 $\frac{1}{4}$ x 24 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 36 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 48 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 60 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 72 $\frac{1}{4}$ | —                                  |
| Nominal Size (in.) (2 in. thick)                        | 9 $\frac{1}{4}$ x 24 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 36 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 48 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 60 $\frac{1}{4}$ | 9 $\frac{1}{4}$ x 72 $\frac{1}{4}$ | —                                  |
| Quantity  | 1                                  | 1                                  | 1                                  | 1                                  | 1                                  | —                                  |
| <b>40UH FILTERS</b>                                     |                                    |                                    |                                    |                                    |                                    |                                    |
| Nominal Size (in.) (1 in. thick)                        | —                                  | 9 $\frac{3}{4}$ x 36 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 48 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 60 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 72 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 72 $\frac{1}{4}$ |
| Nominal Size (in.) (2 in. thick)                        | —                                  | 9 $\frac{3}{4}$ x 36 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 48 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 60 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 72 $\frac{1}{4}$ | 9 $\frac{3}{4}$ x 72 $\frac{1}{4}$ |
| Quantity  | —                                  | 1                                  | 1                                  | 1                                  | 1                                  | 1                                  |
| <b>40UV SHIPPING WEIGHT**</b><br>(Approx lb)            |                                    |                                    |                                    |                                    |                                    |                                    |
| 16 $\frac{5}{8}$ in. Deep Unit                          | 330                                | 400                                | 480                                | 590                                | 660                                | —                                  |
| 21 $\frac{7}{8}$ in. Deep Unit                          | 340                                | 410                                | 490                                | 605                                | 675                                | —                                  |
| <b>40UH SHIPPING WEIGHT**</b><br>(Approx lb)            |                                    |                                    |                                    |                                    |                                    |                                    |
| 34 in. Deep Unit  | —                                  | 420                                | 500                                | 620                                | 690                                | —                                  |
| 39 $\frac{1}{2}$ in. Deep Unit                          | —                                  | 500                                | 600                                | 740                                | 830                                | —                                  |
| 43 $\frac{1}{2}$ in. Deep Unit                          | —                                  | 530                                | 640                                | 790                                | 880                                | 1020                               |
| 47 $\frac{1}{2}$ in. Deep Unit                          | —                                  | —                                  | —                                  | —                                  | —                                  | 1050                               |
| <b>40UV INSTALLED WEIGHT**</b><br>(Approx lb)           |                                    |                                    |                                    |                                    |                                    |                                    |
| 16 $\frac{5}{8}$ in. Deep Unit                          | 315                                | 380                                | 460                                | 570                                | 640                                | —                                  |
| 21 $\frac{7}{8}$ in. Deep Unit                          | 325                                | 390                                | 470                                | 595                                | 655                                | —                                  |
| <b>40UH INSTALLED WEIGHT**</b><br>(Approx lb)           |                                    |                                    |                                    |                                    |                                    |                                    |
| 34 in. Deep Unit  | —                                  | 405                                | 480                                | 600                                | 670                                | —                                  |
| 39 $\frac{1}{2}$ in. Deep Unit                          | —                                  | 485                                | 580                                | 720                                | 810                                | —                                  |
| 43 $\frac{1}{2}$ in. Deep Unit                          | —                                  | 515                                | 620                                | 770                                | 860                                | 1000                               |
| 47 $\frac{1}{2}$ in. Deep Unit                          | —                                  | —                                  | —                                  | —                                  | —                                  | 1030                               |
| <b>COIL WATER WEIGHT</b><br>(Approx lb per row of coil) | 1.0                                | 1.5                                | 2.0                                | 2.4                                | 2.7                                | 2.7                                |
| <b>COIL CONNECTIONS (in. OD)</b>                        |                                    |                                    |                                    |                                    |                                    |                                    |
| Water Coils with 1 to 5 Rows                            |                                    | Return<br>$\frac{7}{8}$            |                                    |                                    | Supply<br>$\frac{7}{8}$            |                                    |
| Steam Coils (All Units)                                 |                                    | $\frac{7}{8}$                      |                                    |                                    | 1 $\frac{1}{8}$                    |                                    |
| DX Coils  |                                    | Suction<br>$\frac{7}{8}$           |                                    |                                    | Liquid<br>$\frac{3}{8}$            |                                    |
| <b>CONDENSATE DRAIN</b>                                 |                                    |                                    |                                    | $\frac{7}{8}$                      |                                    |                                    |

LEGEND  
DX — Direct Expansion

\*40UV only.  
†40UH 43 $\frac{1}{2}$  and 47 $\frac{1}{2}$  in. deep units only.  
\*\*Weight based on damper-controlled unit with 5-row coil and factory-installed controls.

## INSTALLATION

### CAUTION

Units must be installed level and plumb. Failure to do so may result in excessive vibration and/or premature failure.

### Step 1 — Place Units in Position

#### PLACING VERTICAL UNITS

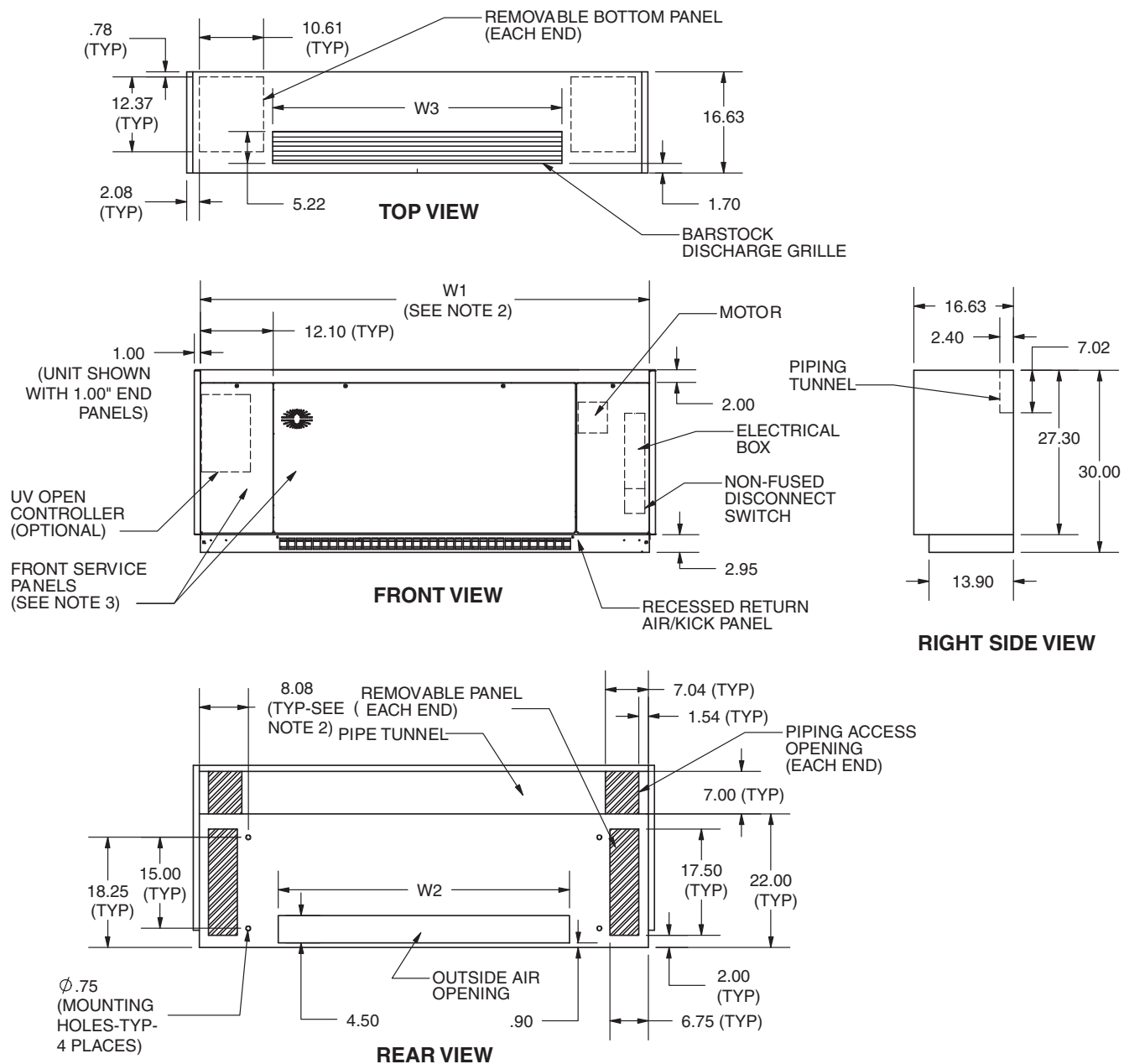
1. Select the unit location; ensure that service clearance is provided. Allow enough grille clearance to maintain unrestricted airflow. See submittal drawings and Fig. 2 and 3 for dimensions.
2. Make sure wall behind unit is smooth and plumb; if necessary, install furring strips on walls with irregular surfaces or mullions. Furring strips must be positioned behind mounting holes in unit. Fasteners, furring strips, and other seals (if required) must be field supplied.
3. Remove all wall and floor moldings from behind the unit.
4. Move unit into position. Unit must be snug against wall and furring strips.
5. Adjust unit leveling legs so unit is level. Unit must be level for proper operation and condensate drainage.
6. Using field-supplied fasteners, reach into unit and attach unit to the wall using the  $\frac{3}{4}$  in. mounting holes in the back panel.
7. Protect the unit from jobsite debris. Do not allow foreign material to fall into drain pan. Prevent dust and debris from being deposited on motor or fan.
8. Vertical units are intended for exposed floor mount application only. Do not suspend from structure.

#### PLACING HORIZONTAL UNITS

1. Select the unit location; ensure that service clearance is provided. Allow enough grille clearance to maintain unrestricted airflow. Make sure that ceiling is able to support the weight of the unit. See Fig. 4-6 for nominal unit weight. See submittal drawings and Fig. 4-6 for dimensions.

NOTE: See page 30 for additional requirements regarding units ducted to multiple openings.

2. Ensure that bottom panels have been removed from unit. When unit is lifted, access to the  $\frac{3}{4}$  in. mounting holes is through the bottom of the unit. Hanger rods and fasteners and other required hardware must be field supplied.
3. Using a forklift or other mechanical lifting device, raise the unit to the mounting position. If forklift or other lifting device is likely to contact a painted wall surface, protect the surface as necessary.
4. Use rods and fasteners to suspend the unit at the mounting holes on the top of the unit. The unit must be suspended at the  $\frac{3}{4}$  in. mounting holes; do not use any other locations.
5. If desired, install field-supplied vibration isolators. Adjust isolators so unit is uniformly suspended and pitched.
6. To ensure proper drainage and operation, ensure unit is level and tighten all fasteners. DO NOT mount the unit on a slope. Pitch of horizontal suspended units can change after coil is filled; recheck after filling coil.
7. Protect the unit from jobsite debris. Do not allow foreign material to fall into drain pan. Prevent dust and debris from being deposited on motor or fan.

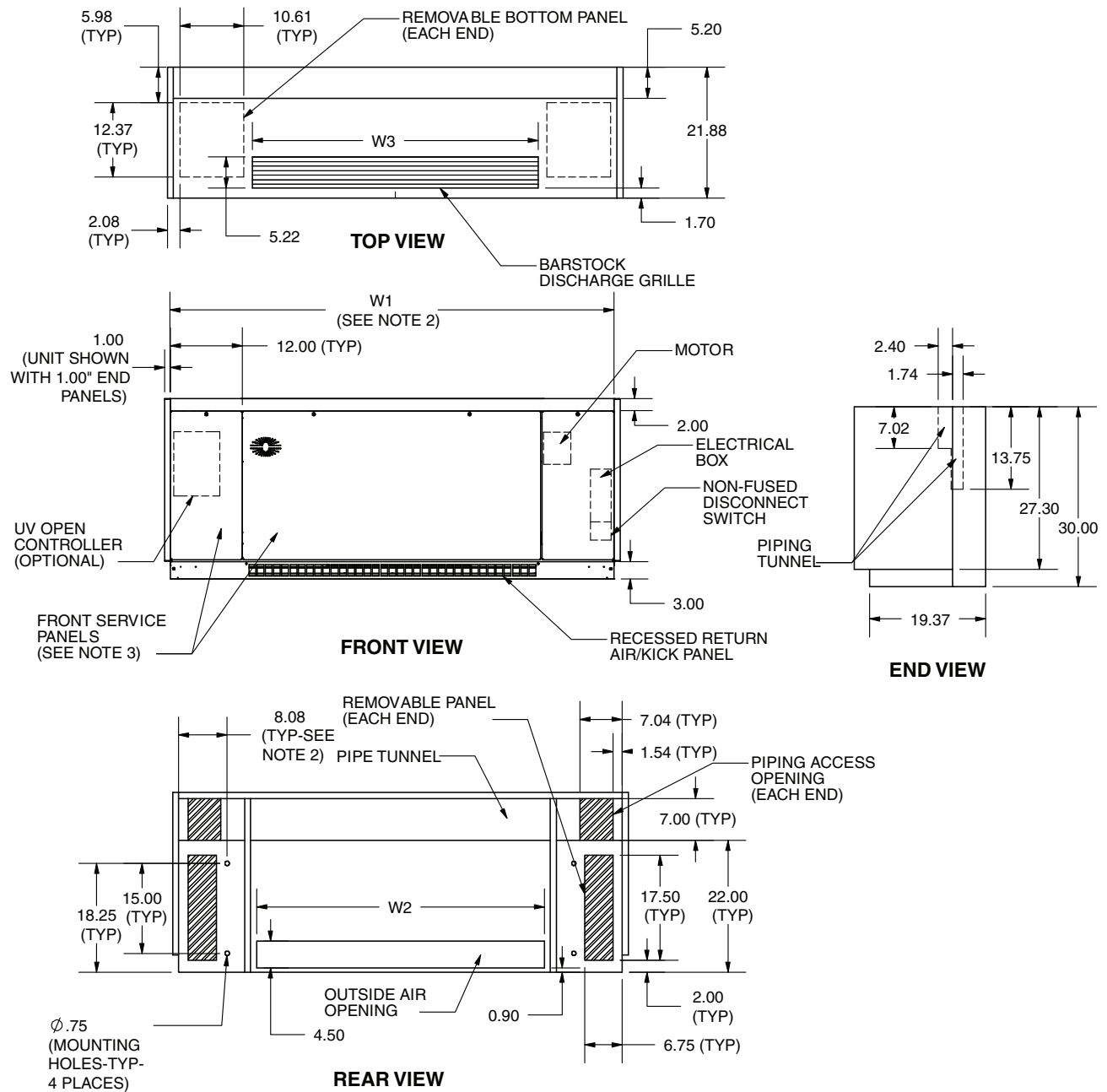


| UNIT<br>40UV | AIRFLOW<br>(cfm) | DIMENSIONS (in.) |    |       | APPROXIMATE<br>SHIPPING<br>WEIGHT (lb) | APPROXIMATE<br>INSTALLED<br>WEIGHT (lb) |
|--------------|------------------|------------------|----|-------|--|---|
|              |                  | W1               | W2 | W3    |  |   |
| 050          | 500              | 50               | 24 | 16.60 | 330                                    | 315                                     |
| 075          | 750              | 62               | 36 | 31.67 | 400                                    | 380                                     |
| 100          | 1000             | 74               | 48 | 46.74 | 480                                    | 460                                     |
| 125          | 1250             | 86               | 60 | 61.81 | 590                                    | 570                                     |
| 150          | 1500             | 98               | 72 | 78.47 | 660                                    | 640                                     |

**NOTES:**

1. All dimensions are in inches.
2. Dimension does not include end panels.
3. Three front panels provided for service access.
4. Motor and electrical power input box on right side of unit. Box includes fan speed switch, On/Off switch and non-fused disconnect switch.
5. Connection hand is determined by facing discharge of unit.

**Fig. 2 — 40UV Dimensions — 16<sup>5</sup>/<sub>8</sub>-in. Deep Units (Standard)**

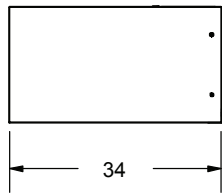


| UNIT<br>40UV | AIRFLOW<br>(cfm) | DIMENSIONS (in.) |    |       | APPROXIMATE<br>SHIPPING<br>WEIGHT (lb) | APPROXIMATE<br>INSTALLED<br>WEIGHT (lb) |
|--------------|------------------|------------------|----|-------|--|---|
|              |                  | W1               | W2 | W3    |  |   |
| 050          | 500              | 50               | 24 | 16.60 | 340                                    | 325                                     |
| 075          | 750              | 62               | 36 | 31.67 | 410                                    | 390                                     |
| 100          | 1000             | 74               | 48 | 46.74 | 490                                    | 470                                     |
| 125          | 1250             | 86               | 60 | 61.81 | 605                                    | 595                                     |
| 150          | 1500             | 98               | 72 | 78.47 | 675                                    | 655                                     |

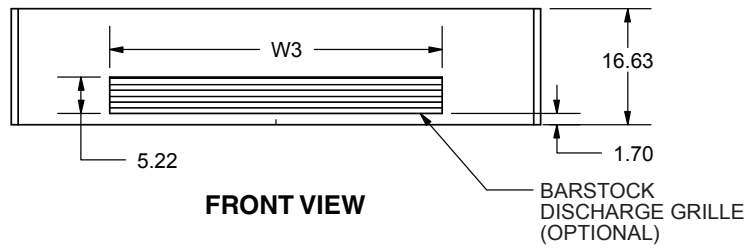
**NOTES:**

1. All dimensions are in inches.
2. Dimension does not include end panels.
3. Three front panels provided for service access.
4. Motor and electrical power input box on right side of unit. Box includes fan speed switch, On/Off switch and non-fused disconnect switch.
5. Connection hand is determined by facing discharge of unit.

**Fig. 3 — 40UV Dimensions — 21<sup>7</sup>/<sub>8</sub>-in. Deep Units  
(With Piping Chase)**

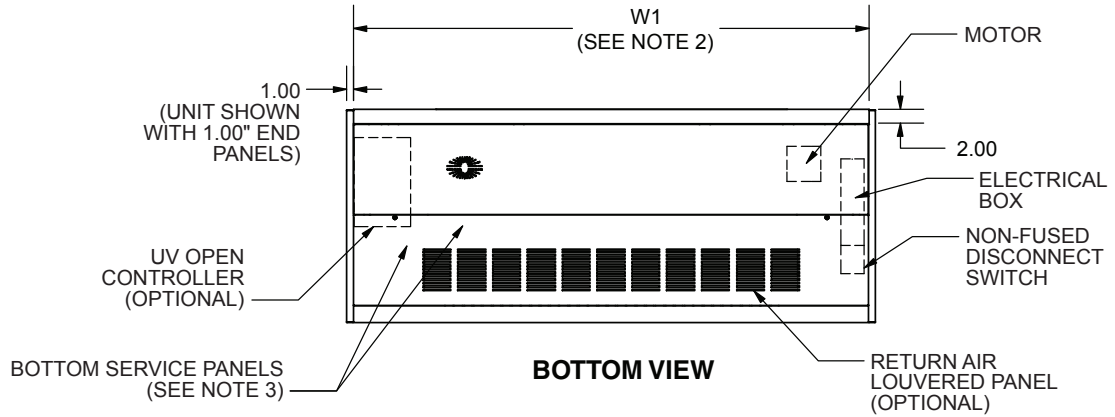


**LEFT SIDE VIEW**

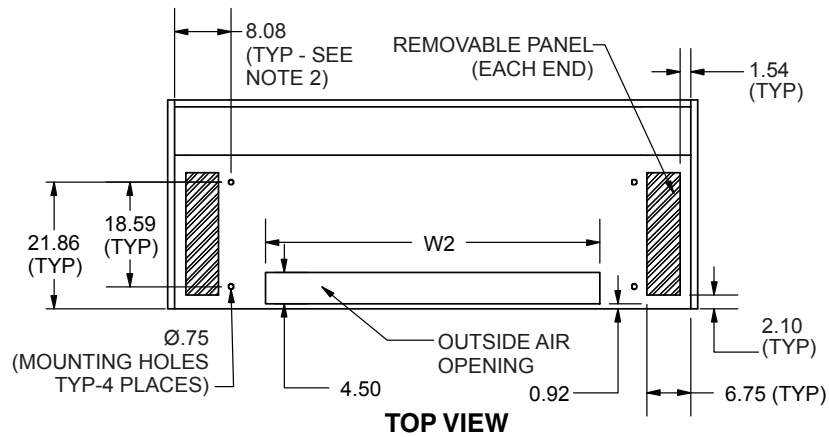


**FRONT VIEW**

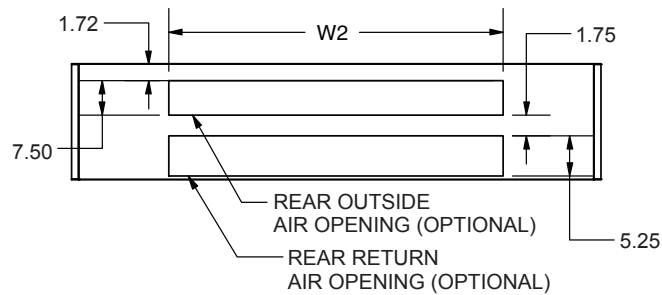
BARSTOCK  
DISCHARGE GRILLE  
(OPTIONAL)



**BOTTOM VIEW**



**TOP VIEW**



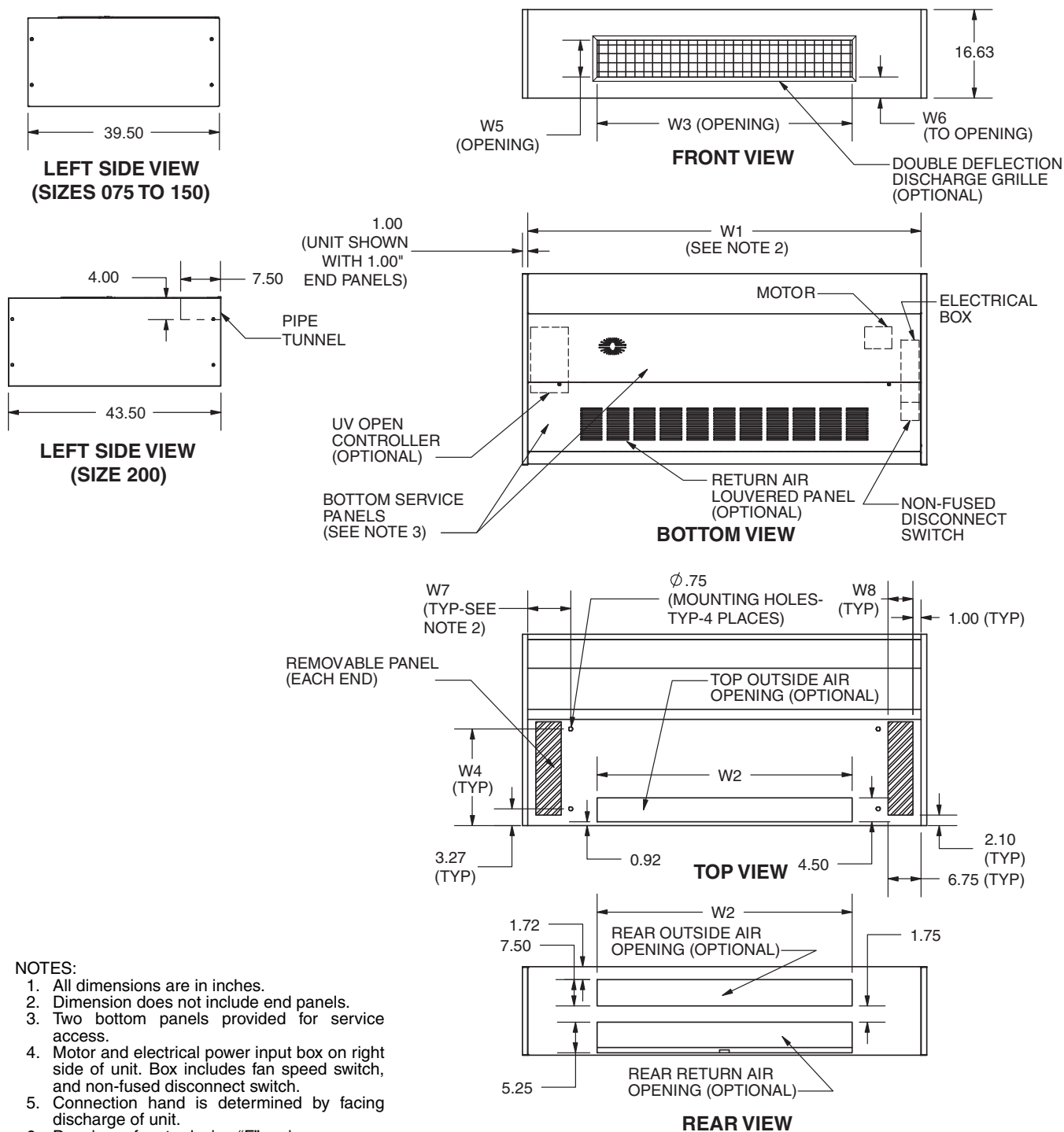
**REAR VIEW**

| UNIT<br>40UH | AIRFLOW<br>(cfm) | DIMENSIONS (in.) |    |       | APPROXIMATE<br>SHIPPING<br>WEIGHT (lb) | APPROXIMATE<br>INSTALLED<br>WEIGHT (lb) |
|--------------|------------------|------------------|----|-------|--|---|
|              |                  | W1               | W2 | W3    |  |   |
| 075          | 750              | 62               | 36 | 31.67 | 420                                    | 405                                     |
| 100          | 1000             | 74               | 48 | 46.74 | 500                                    | 480                                     |
| 125          | 1250             | 86               | 60 | 61.81 | 620                                    | 600                                     |
| 150          | 1500             | 98               | 72 | 78.47 | 690                                    | 670                                     |

**NOTES:**

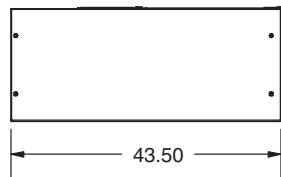
1. All dimensions are in inches.
2. Dimension does not include end panels.
3. Two bottom panels provided for service access.
4. Motor and electrical power input box on right side of unit. Box includes fan speed switch, and non-fused disconnect switch.
5. Drawing refers to Design "F" units.

**Fig. 4 — 40UH Dimensions — 34-in. Deep Units (Digit Code #11 — Option A, B, or C)**

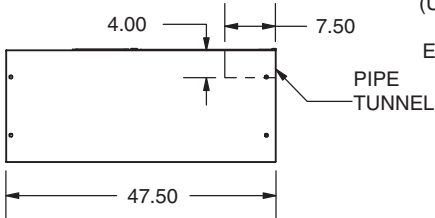


| UNIT<br>40UH | AIRFLOW<br>(cfm) | DEPTH<br>(in.) | DIMENSIONS (in.) |    |    |       |       |      |      |      | APPROXIMATE<br>SHIPPING<br>WEIGHT (lb) | APPROXIMATE<br>INSTALLED<br>WEIGHT (lb) |
|--------------|------------------|----------------|------------------|----|----|-------|-------|------|------|------|--|---|
|              |                  |                | W1               | W2 | W3 | W4    | W5    | W6   | W7   | W8   |  |   |
| 075          | 750              | 36             | 62               | 36 | 36 | 21.86 | 7.00  | 2.31 | 8.00 | 4.75 | 500                                    | 485                                     |
| 100          | 1000             | 36             | 74               | 48 | 48 | 21.86 | 7.00  | 2.31 | 8.00 | 4.75 | 600                                    | 580                                     |
| 125          | 1250             | 36             | 86               | 60 | 60 | 21.86 | 7.00  | 2.31 | 8.00 | 4.75 | 740                                    | 720                                     |
| 150          | 1500             | 36             | 98               | 72 | 72 | 21.86 | 7.00  | 2.31 | 8.00 | 4.75 | 830                                    | 810                                     |
| 200          | 2000             | 40             | 98               | 72 | 72 | 30.00 | 10.00 | 1.44 | 8.07 | 4.00 | 1020                                   | 1000                                    |

**Fig. 5 — 40UH Dimensions — 39 1/2 in. and 43 1/2 in. Deep Unit with Front Discharge Plenum (Digit Code #11 — Option D or E)**



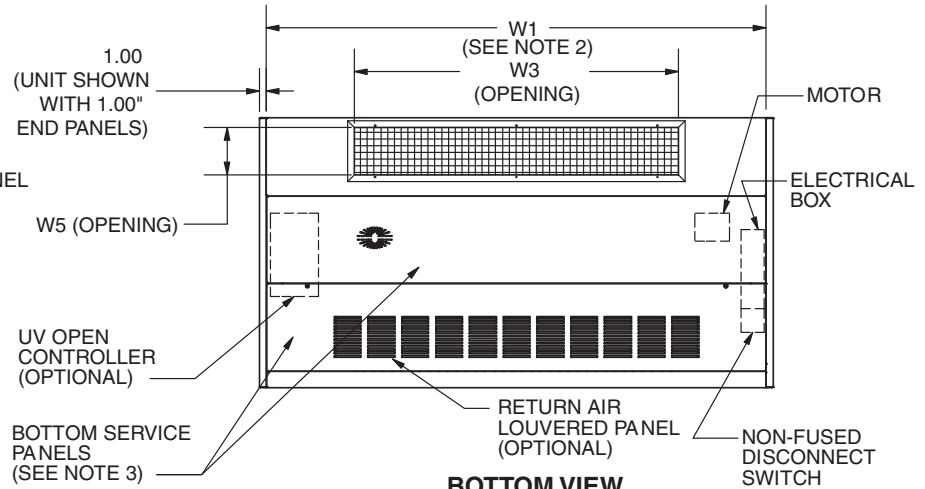
**LEFT SIDE VIEW  
(SIZES 075 TO 150)**



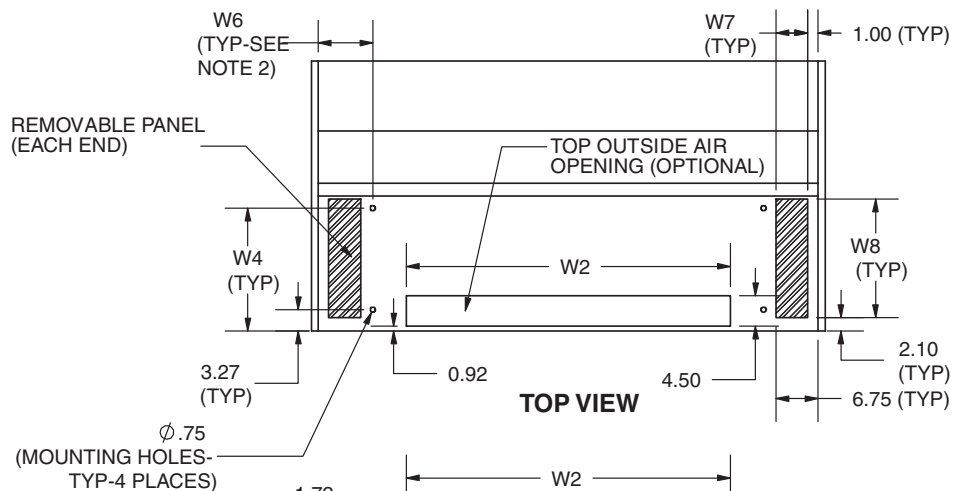
**LEFT SIDE VIEW  
(SIZE 200)**



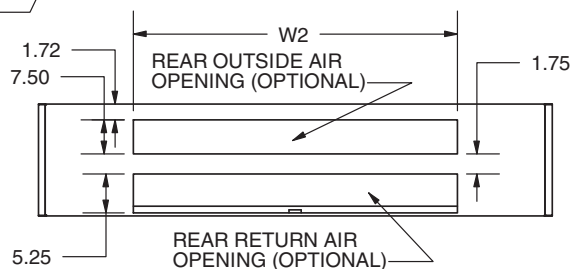
**FRONT VIEW**



**BOTTOM VIEW**



**TOP VIEW**



**REAR VIEW**

**NOTES:**

1. All dimensions are in inches.
2. Dimension does not include end panels.
3. Two bottom panels provided for service access.
4. Motor and electrical power input box on right side of unit. Box includes fan speed switch, and non-fused disconnect switch.
5. Connection hand is determined by facing discharge of unit.
6. Drawings refer to design "F" units.

| UNIT | AIRFLOW<br>(cfm) | DEPTH<br>(in.) | DIMENSIONS (in.) |    |    |       |       |      |      | APPROXIMATE<br>SHIPPING<br>WEIGHT (lb) | APPROXIMATE<br>INSTALLED<br>WEIGHT (lb) |
|------|------------------|----------------|------------------|----|----|-------|-------|------|------|--|---|
|      |                  |                | W1               | W2 | W3 | W4    | W5    | W6   | W7   |  |   |
| 075  | 750              | 40             | 62               | 36 | 36 | 21.86 | 7.00  | 8.00 | 4.75 | 530                                    | 515                                     |
| 100  | 1000             | 40             | 74               | 48 | 48 | 21.86 | 7.00  | 8.00 | 4.75 | 640                                    | 620                                     |
| 125  | 1250             | 40             | 86               | 60 | 60 | 21.86 | 7.00  | 8.00 | 4.75 | 790                                    | 770                                     |
| 150  | 1500             | 40             | 98               | 72 | 72 | 21.86 | 7.00  | 8.00 | 4.75 | 880                                    | 860                                     |
| 200  | 2000             | 44             | 98               | 72 | 72 | 30.00 | 10.00 | 8.07 | 4.00 | 1050                                   | 1030                                    |

**Fig. 6 — 40UH Dimensions — 43 1/2 in. and 47 1/2 in. Deep Unit with Down Discharge Plenum  
(Digit Code #11 — Option F)**

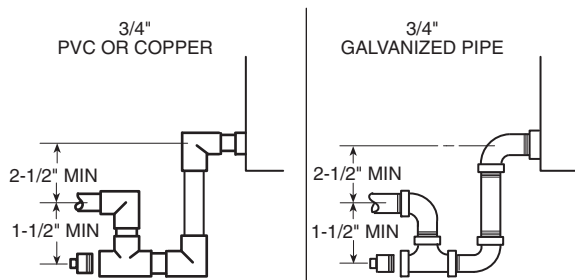


**Step 2 — Make Piping Connections** — Access to piping is available through the access panels at the front, top, or end of the vertical unit (horizontal access from bottom or side). Route piping through the pipe tunnel or the unit's back panel or floor panel. Metal blank-off panels must be trimmed to complete piping installation. Metal blank-off panels must be retro-fitted around the piping to restore installation integrity. All piping connections must be performed by qualified personnel in accordance with local and national codes.

### ⚠ CAUTION

When making solder connections, care must be taken to prevent the dripping of solder or other debris onto the insulation, control wiring, control box, actuators, and DDC (Direct Digital Controls) controller (if so equipped). When using a torch anywhere in the unit, care must be taken to not burn any components.

**DRAIN CONNECTIONS** — Condensate drain connections are located on each end of the drain pan near the bottom of the unit. Access by removing the end panel. Condensate drain line must be  $\frac{3}{4}$  in. copper tubing, galvanized pipe, PVC or similar plastic pipe. Install drain line in accordance with all applicable codes. Insulate the drain line to prevent sweating. See Fig. 7 for typical drain trap construction.



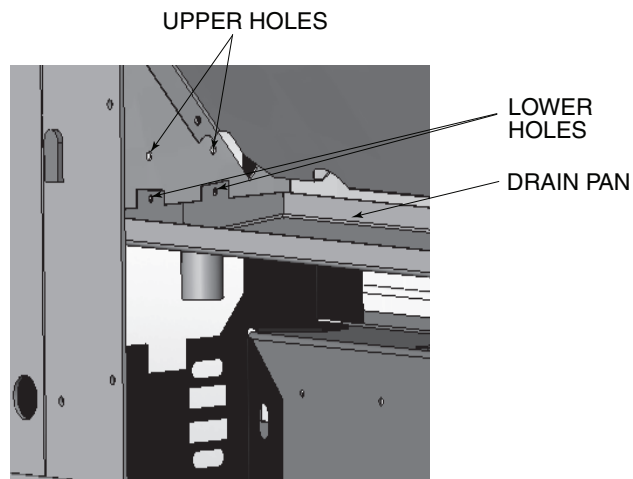
**Fig. 7 — Typical Condensate Drain Trap Construction**

**NOTE:** Drain pan is sloped toward the connections of the largest coil or toward the connections of the DX (direct expansion) coil. In a unit with 2-row right hand coils and 4-row left hand coils for example, the drain pan is sloped down to the left hand side. The uphill connection is sealed with a plug. The downhill field connection is covered with a plastic cap except when the drain pan is stainless steel, then both connections are sealed with a plug. Remove cap (or plug on stainless steel) on the downhill connection. Do not remove the high side drain connection plug. The slope may be reversed in the field by removing the drain pan screws (2 per side), using the opposite set of holes to install the pan, and sealing the uphill connection. See Fig. 8 and 9.

Units with cooling coils require traps to prevent air from entering the condensate fitting and preventing proper drainage. Drain must be sloped downhill from the unit a minimum of  $\frac{1}{8}$  in. per ft. Drain must be free and clear at all times. It is not recommended to tie multiple units into one condensate line due to potential for overflow.

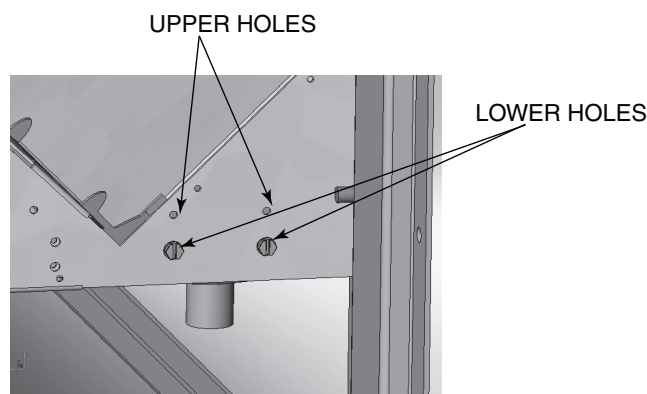
### ⚠ CAUTION

Insulate drain lines to prevent condensate. Care must be taken to avoid interference with control panel on left side drain. Failure to comply could result in equipment damage.



**NOTE:** Reverse slope by reversing connections on each end of the pan.

**Fig. 8 — Drain Pan Connection Holes, Inside View**



**Fig. 9 — Drain Pan Connection Holes, Outside View**

**WATER SUPPLY/RETURN CONNECTIONS** — Install piping in accordance with all applicable codes. All piping must be supported separately from coils.

Water supply must be connected so that entering water is on leaving-air side of coil. See the connection labels on the unit to locate the inlet. Coils must be adequately vented to prevent air binding. Be sure valves are in proper operating position and are easily accessible for adjustment.

If coil and valve package connections will be made with a solder joint, care should be taken to ensure that components in the valve package are not subjected to high temperatures which may damage seals or other materials. Many 2-position electric control valves are provided with a manual operating lever. This lever should be in the OPEN position during all soldering operations.

If coil connection is made with a union, the coil side of the union must be prevented from turning (it must be backed up) during tightening. *Do not overtighten! Overtightening will distort (egg shape) the union seal surface and destroy the union.*

**NOTE:** A freeze-stat is factory-installed when a hot water/steam coil is installed.

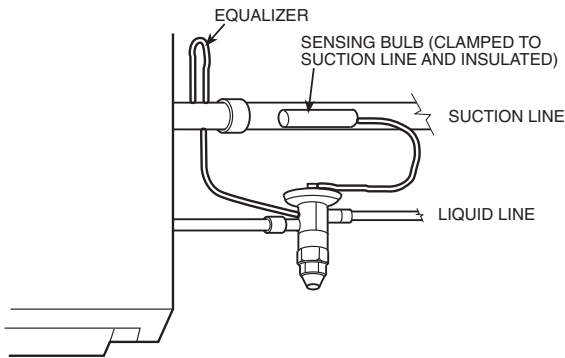
**STEAM CONNECTIONS** — On units with steam heating coils, the maximum steam pressure applied to the unit should never exceed 6 psig. Carrier recommends float and thermostatic ("F&T") type steam traps for best results. However, other styles may work and selection is the responsibility of the customer. Sizing and selection of the steam trap and design of the steam system piping should be done with the recommendation of the steam trap supplier. A vacuum breaker is factory supplied with the unit ventilator steam coil, and must be field

pipd to a location downstream of the trap to allow vacuum relief when the coil is turned off. In all situations, the steam piping connected to the unit should be designed and installed according to good piping practices for steam systems.

**DIRECT EXPANSION REFRIGERANT PIPING** — Use the condensing unit manufacturer's recommended line sizes and requirements. Perform leak test using nitrogen. Evacuate and charge per recommended heating, ventilation, and air conditioning (HVAC) procedures and all applicable codes. Insulate suction line after leak test up to the coil section end plate for correct operation and to eliminate sweating. Use refrigerant-grade copper lines only. Units utilizing R-22 refrigerant are **NOT** to be applied as a heat pump.

See Fig. 10 for refrigerant piping connections with recommended locations for the thermostatic expansion valve (TXV) and sensing bulb. Locate bulb in the horizontal run from approximately the 9:00 to 3:00 position or in a vertical run.

**NOTE:** A low limit sensing bulb is factory-installed when a DX coil is installed.



**NOTE:** Follow TXV manufacturer's instructions.

**Fig. 10 — Typical TXV Installation**

**HYDRONIC COIL PIPING** — When all joints are complete, perform hydrostatic test for leaks. Vent all coils at this time. Check interior unit piping for signs of leakage from shipping damage or mishandling. If leaks are found, notify a Carrier representative before initiating any repairs. Release trapped air from system (refer to Step 6 — Make Final Preparations section).

#### ⚠ CAUTION

All water coils must be protected from freezing after initial filling with water. Even if system is drained, unit coils may still have enough remaining water to cause damage when exposed to temperatures below freezing.

Following the hydrostatic test, the installer shall insulate all piping up to the coil section end plate to prevent condensation (sweating) and heat loss. Ensure that factory-provided valve packages are properly insulated. Piping insulation is the

responsibility of the installer and should be suitable thickness to prevent sweating and with adequate vapor barrier.

To ensure compliance with building codes, restore the structure's original fire resistance rating by sealing all holes with material carrying the same fire rating as the structure.

**CONTROL VALVES** — Controls require normally open heating valves. Chilled water valves must be piped normally closed. It is recommended that heating valves fail safe to the open position in all control applications. Valve packages must always be field insulated to prevent sweating. See Fig. 11 for piping recommendations.

**Step 3 — Make Electrical Connections** — Refer to unit serial plate for required supply voltage, fan and heater amperage and required circuit ampacities. Refer to unit wiring diagram for unit and field wiring. See Tables 2-4 for electrical data.

Access to all electrical connections can be gained through the access panel at the right front side of the unit. See the dimensional drawings Fig. 2-6 for electrical box connections.

The fan motor should never be controlled by any wiring or device other than the factory-supplied switch or thermostat/switch combination unless prior factory authorization is obtained. Fan motor may be temporarily wired for use during construction only with prior factory approval and only in strict accordance with the instructions issued at that time.

All electrical connections should be made by qualified personnel and be in accordance with governing codes and ordinances. Any modification of unit wiring without factory authorization will invalidate all factory warranties and nullify any agency listings. See Fig. 12-22 for typical wiring connections for basic unit without UV Open controls.

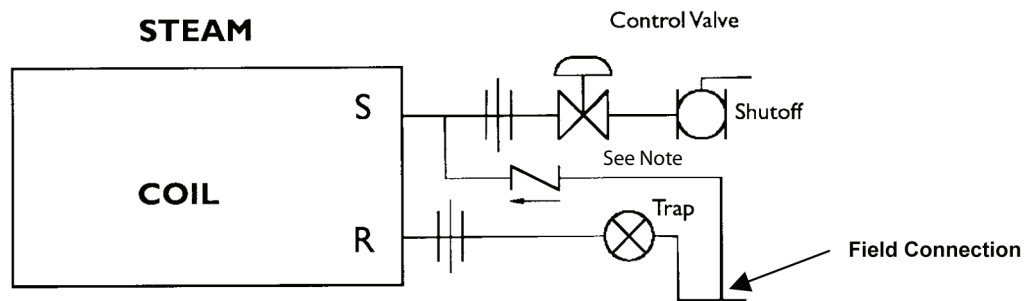
Electric heat elements are the open wire type mounted in individual heavy gage galvanized steel frames and suspended in ceramic insulators. Dual capillary type thermal sensing elements, one automatic reset and one manual, is used to protect the unit from overheating in the event of abnormal operation. Automatic reset limit is set at 210 F. The access for the limit switch is located on the opposite end of the fan motor. Manual reset high limit is set at 240 F. The access for the limit switch is located at the same end as the fan motor.

**Step 4 — Mount Actuators (Field-Supplied)** —

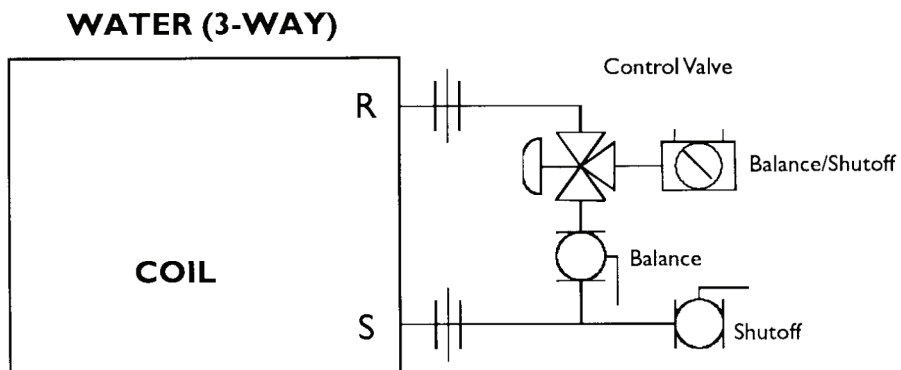
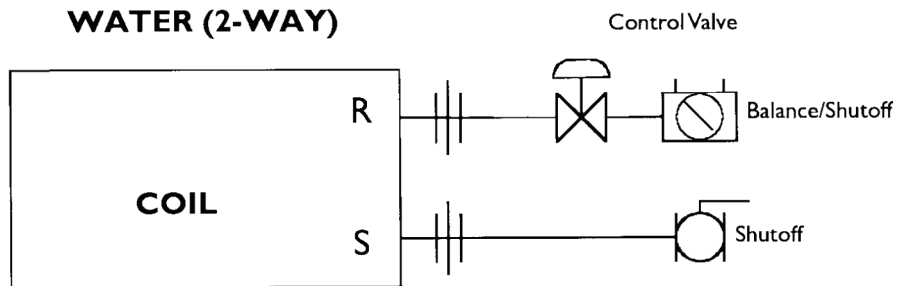
Field-supplied actuators must be mounted on 1/2 in. diameter damper shafts.


#### ⚠ CAUTION

With factory-installed controls provided by others, factory may wire controls and actuator based on the request; however, setting the actuators (switch settings, tightening clamp to damper shaft, torque pre-loading, etc.) is the sole responsibility of the customer. Failure to set the actuator may result in equipment damage.



NOTE: Factory-supplied vacuum breaker assembly. Field install in vertical orientation with flow arrow up and piping down so that ball seats with gravity. Equalizer line and trap are field supplied and installed.



LEGEND  
**S** — Supply  
**R** — Return  
 Union

**Fig. 11 — Control Valves**

**Table 2 — Electric Heater Data for Units with PSC Motor**

| UNIT                               | HP  | NOMINAL<br>V/Ph/Hz | NUMBER OF<br>ELEMENTS | FLA  | LAT (F) | MCA  | MOCP | TOTAL<br>CAPACITY (kW) |
|------------------------------------|-----|--------------------|-----------------------|------|---------|------|------|------------------------|
| <b>40UV050<br/>(at 500 Cfm)</b>    | 1/5 | 208/1/60           | 3                     | 17.2 | 90      | 21.5 | 25   | 3.2                    |
|                                    |     |                    | 4                     | 22.2 | 97      | 27.8 | 30   | 4.2                    |
|                                    |     |                    | 5                     | 27.3 | 104     | 34.1 | 35   | 5.3                    |
|                                    |     |                    | 6                     | 32.3 | 110     | 40.4 | 45   | 6.3                    |
|                                    |     | 240/1/60           | 3                     | 19.5 | 97      | 24.4 | 25   | 4.2                    |
|                                    |     |                    | 4                     | 25.3 | 106     | 31.7 | 35   | 5.6                    |
|                                    |     |                    | 5                     | 31.2 | 115     | 39.0 | 40   | 7.0                    |
|                                    |     |                    | 6                     | 37.0 | 124     | 46.3 | 50   | 8.4                    |
|                                    |     | 277/1/60           | 3                     | 16.8 | 97      | 21.0 | 25   | 4.2                    |
|                                    |     |                    | 4                     | 21.8 | 106     | 27.3 | 30   | 5.6                    |
|                                    |     |                    | 5                     | 26.9 | 115     | 33.6 | 35   | 7.0                    |
|                                    |     |                    | 6                     | 31.9 | 124     | 39.9 | 40   | 8.4                    |
|                                    |     | 208/3/60           | 3                     | 10.8 | 90      | 13.5 | 15   | 3.2                    |
|                                    |     |                    | 4                     | 15.8 | 97      | 19.8 | 20   | 4.2                    |
|                                    |     |                    | 5                     | 19.5 | 104     | 24.4 | 25   | 5.3                    |
|                                    |     |                    | 6                     | 19.5 | 110     | 24.4 | 25   | 6.3                    |
|                                    |     | 240/3/60           | 3                     | 12.1 | 97      | 15.1 | 20   | 4.2                    |
|                                    |     |                    | 4                     | 17.9 | 106     | 22.4 | 25   | 5.6                    |
|                                    |     |                    | 5                     | 22.2 | 115     | 27.8 | 30   | 7.0                    |
|                                    |     |                    | 6                     | 22.2 | 124     | 27.8 | 30   | 8.4                    |
|                                    |     | 460/3/60           | 3                     | 6.0  | 97      | 7.5  | 15   | 4.2                    |
|                                    |     |                    | 4                     | 8.9  | 106     | 11.1 | 15   | 5.6                    |
|                                    |     |                    | 5                     | 11.0 | 115     | 13.8 | 15   | 7.0                    |
|                                    |     |                    | 6                     | 11.0 | 124     | 13.8 | 15   | 8.4                    |
| <b>40UV,UH075<br/>(at 750 Cfm)</b> | 1/5 | 208/1/60           | 3                     | 23.7 | 89      | 29.6 | 30   | 4.5                    |
|                                    |     |                    | 4                     | 30.9 | 96      | 38.6 | 40   | 6.0                    |
|                                    |     |                    | 5                     | 38.1 | 102     | 47.6 | 50   | 7.5                    |
|                                    |     |                    | 6                     | 45.3 | 108     | 56.7 | 60   | 9.0                    |
|                                    |     | 240/1/60           | 3                     | 27.0 | 96      | 33.8 | 35   | 6.0                    |
|                                    |     |                    | 4                     | 35.3 | 104     | 44.2 | 45   | 8.0                    |
|                                    |     |                    | 5                     | 43.7 | 113     | 54.6 | 60   | 10.0                   |
|                                    |     |                    | 6                     | 52.0 | 121     | 65.0 | 70   | 12.0                   |
|                                    |     | 277/1/60           | 3                     | 23.3 | 96      | 29.1 | 30   | 6.0                    |
|                                    |     |                    | 4                     | 30.5 | 104     | 38.1 | 40   | 8.0                    |
|                                    |     |                    | 5                     | 37.7 | 113     | 47.1 | 50   | 10.0                   |
|                                    |     |                    | 6                     | 44.9 | 121     | 56.2 | 60   | 12.0                   |
|                                    |     | 208/3/60           | 3                     | 14.5 | 89      | 18.2 | 20   | 4.5                    |
|                                    |     |                    | 4                     | 21.7 | 96      | 27.2 | 30   | 6.0                    |
|                                    |     |                    | 5                     | 27.0 | 102     | 33.8 | 35   | 7.5                    |
|                                    |     |                    | 6                     | 27.0 | 108     | 33.8 | 35   | 9.0                    |
|                                    |     | 240/3/60           | 3                     | 16.5 | 96      | 20.6 | 25   | 6.0                    |
|                                    |     |                    | 4                     | 24.8 | 104     | 31.0 | 35   | 8.0                    |
|                                    |     |                    | 5                     | 30.9 | 113     | 38.6 | 40   | 10.0                   |
|                                    |     |                    | 6                     | 30.9 | 121     | 38.6 | 40   | 12.0                   |
|                                    |     | 460/3/60           | 3                     | 8.2  | 96      | 10.2 | 15   | 6.0                    |
|                                    |     |                    | 4                     | 12.3 | 104     | 15.4 | 20   | 8.0                    |
|                                    |     |                    | 5                     | 15.4 | 113     | 19.2 | 20   | 10.0                   |
|                                    |     |                    | 6                     | 15.4 | 121     | 19.2 | 20   | 12.0                   |

**LEGEND**

|             |  |
|-------------|--|
| <b>FLA</b>  | — Full Load Amps   |
| <b>LAT</b>  | — Leaving-Air Temperature at 70 F Entering-Air Temperature                   |
| <b>MCA</b>  | — Unit Minimum Circuit Ampacity  |
| <b>MOCP</b> | — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps) |
| <b>PSC</b>  | — Permanent Split Capacitor  |

\*Cooling coil must be left-hand coil connections only.

**NOTES:**

1. LAT (leaving air temperature) is at maximum fan speed with entering air temperature at 70 F.
2. Face and bypass units are available only with 3 elements.
3. Electric heat is available in the reheat only position.
4. The PSC motor is not available on unit size 200.

**Table 2 — Electric Heater Data for Units with PSC Motor (cont)**

| UNIT                                | HP            | NOMINAL<br>V/Ph/Hz | NUMBER OF<br>ELEMENTS | FLA  | LAT (F) | MCA   | MOCP | TOTAL<br>CAPACITY (kW) |
|-------------------------------------|---------------|--------------------|-----------------------|------|---------|-------|------|------------------------|
| <b>40UV,UH100<br/>(at 1000 Cfm)</b> | $\frac{1}{5}$ | 208/1/60           | 3                     | 30.9 | 89      | 38.6  | 40   | 6.0                    |
|                                     |               |                    | 4                     | 40.5 | 95      | 50.7  | 60   | 8.0                    |
|                                     |               |                    | 5                     | 50.2 | 102     | 62.7  | 70   | 10.0                   |
|                                     |               |                    | 6                     | 59.8 | 108     | 74.7  | 80   | 11.9                   |
|                                     |               | 240/1/60           | 3                     | 35.3 | 96      | 44.2  | 45   | 8.0                    |
|                                     |               |                    | 4                     | 46.5 | 104     | 58.1  | 60   | 10.7                   |
|                                     |               |                    | 5                     | 57.6 | 112     | 72.0  | 80   | 13.3                   |
|                                     |               |                    | 6                     | 68.7 | 121     | 85.8  | 90   | 16.0                   |
|                                     |               | 277/1/60           | 3                     | 30.5 | 96      | 38.1  | 40   | 8.0                    |
|                                     |               |                    | 4                     | 40.1 | 104     | 50.1  | 60   | 10.7                   |
|                                     |               |                    | 5                     | 49.7 | 112     | 62.2  | 70   | 13.3                   |
|                                     |               |                    | 6                     | 59.4 | 121     | 74.2  | 80   | 16.0                   |
|                                     |               | 208/3/60           | 3                     | 18.7 | 89      | 23.4  | 25   | 6.0                    |
|                                     |               |                    | 4                     | 28.3 | 95      | 35.4  | 40   | 8.0                    |
|                                     |               |                    | 5                     | 35.4 | 102     | 44.3  | 45   | 10.0                   |
|                                     |               |                    | 6                     | 35.4 | 108     | 44.3  | 45   | 11.9                   |
|                                     |               | 240/3/60           | 3                     | 21.3 | 96      | 26.6  | 30   | 8.0                    |
|                                     |               |                    | 4                     | 32.4 | 104     | 40.5  | 45   | 10.7                   |
|                                     |               |                    | 5                     | 40.5 | 112     | 50.7  | 60   | 13.3                   |
|                                     |               |                    | 6                     | 40.5 | 121     | 50.7  | 60   | 16.0                   |
|                                     |               | 460/3/60           | 3                     | 10.6 | 96      | 13.2  | 15   | 8.0                    |
|                                     |               |                    | 4                     | 16.1 | 104     | 20.1  | 25   | 10.7                   |
|                                     |               |                    | 5                     | 20.2 | 112     | 25.2  | 30   | 13.3                   |
|                                     |               |                    | 6                     | 20.2 | 121     | 25.2  | 30   | 16.0                   |
| <b>40UV,UH125<br/>(at 1250 Cfm)</b> | $\frac{1}{5}$ | 208/1/60           | 3                     | 38.1 | 89      | 47.6  | 50   | 7.5                    |
|                                     |               |                    | 4                     | 50.1 | 96      | 62.7  | 70   | 10.0                   |
|                                     |               |                    | 5                     | 62.2 | 102     | 77.7  | 80   | 12.5                   |
|                                     |               |                    | 6*                    | 74.2 | 108     | 92.8  | 100  | 15.0                   |
|                                     |               | 240/1/60           | 3                     | 43.7 | 96      | 54.6  | 60   | 10.0                   |
|                                     |               |                    | 4                     | 57.6 | 104     | 71.9  | 80   | 13.3                   |
|                                     |               |                    | 5                     | 71.4 | 113     | 89.3  | 90   | 16.7                   |
|                                     |               |                    | 6*                    | 85.3 | 121     | 106.7 | 110  | 20.0                   |
|                                     |               | 277/1/60           | 3                     | 37.7 | 96      | 47.1  | 50   | 10.0                   |
|                                     |               |                    | 4                     | 49.7 | 104     | 62.2  | 70   | 13.3                   |
|                                     |               |                    | 5                     | 61.8 | 113     | 77.2  | 80   | 16.7                   |
|                                     |               |                    | 6*                    | 73.8 | 121     | 92.2  | 100  | 20.0                   |
|                                     |               | 208/3/60           | 3                     | 22.9 | 89      | 28.6  | 30   | 7.5                    |
|                                     |               |                    | 4                     | 34.9 | 96      | 43.6  | 45   | 10.0                   |
|                                     |               |                    | 5                     | 43.7 | 102     | 54.7  | 60   | 12.5                   |
|                                     |               |                    | 6*                    | 43.7 | 108     | 54.7  | 60   | 15.0                   |
|                                     |               | 240/3/60           | 3                     | 26.1 | 96      | 32.6  | 35   | 10.0                   |
|                                     |               |                    | 4                     | 40.0 | 104     | 50.0  | 50   | 13.3                   |
|                                     |               |                    | 5                     | 50.2 | 113     | 62.7  | 70   | 16.7                   |
|                                     |               |                    | 6*                    | 50.2 | 121     | 62.7  | 70   | 20.0                   |
|                                     |               | 460/3/60           | 3                     | 13.0 | 96      | 16.2  | 20   | 10.0                   |
|                                     |               |                    | 4                     | 19.9 | 104     | 24.9  | 25   | 13.3                   |
|                                     |               |                    | 5                     | 25.0 | 113     | 31.3  | 35   | 16.7                   |
|                                     |               |                    | 6*                    | 25.0 | 121     | 31.3  | 35   | 20.0                   |

**LEGEND**

**FLA** — Full Load Amps  
**LAT** — Leaving-Air Temperature at 70 F Entering-Air Temperature  
**MCA** — Unit Minimum Circuit Ampacity  
**MOCP** — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps)  
**PSC** — Permanent Split Capacitor

\*Cooling coil must be left-hand coil connections only.

**NOTES:**

1. LAT (leaving air temperature) is at maximum fan speed with entering air temperature at 70 F.
2. Face and bypass units are available only with 3 elements.
3. Electric heat is available in the reheat only position.
4. The PSC motor is not available on unit size 200.

**Table 2 — Electric Heater Data for Units with PSC Motor (cont)**

| UNIT                                | HP  | NOMINAL<br>V/Ph/Hz | NUMBER OF<br>ELEMENTS | FLA  | LAT (F) | MCA   | MOCP | TOTAL<br>CAPACITY (kW) |
|-------------------------------------|-----|--------------------|-----------------------|------|---------|-------|------|------------------------|
| <b>40UV,UH150<br/>(at 1500 Cfm)</b> | 1/5 | 208/1/60           | 3                     | 45.3 | 89      | 56.7  | 60   | 9.0                    |
|                                     |     |                    | 4                     | 59.8 | 96      | 74.7  | 80   | 12.0                   |
|                                     |     |                    | 5                     | 74.2 | 102     | 92.8  | 100  | 15.0                   |
|                                     |     |                    | 6*                    | 88.7 | 108     | 110.8 | 125  | 18.0                   |
|                                     |     | 240/1/60           | 3                     | 52.0 | 96      | 65.0  | 70   | 12.0                   |
|                                     |     |                    | 4                     | 68.7 | 104     | 85.8  | 90   | 16.0                   |
|                                     |     |                    | 5                     | 85.3 | 113     | 106.7 | 110  | 20.0                   |
|                                     |     |                    | 6                     | —    | —       | —     | —    | —                      |
|                                     |     | 277/1/60           | 3                     | 44.9 | 96      | 56.2  | 60   | 12.0                   |
|                                     |     |                    | 4                     | 59.4 | 104     | 74.2  | 80   | 16.0                   |
|                                     |     |                    | 5                     | 73.8 | 113     | 92.3  | 100  | 20.0                   |
|                                     |     |                    | 6                     | —    | —       | —     | —    | —                      |
|                                     |     | 208/3/60           | 3                     | 27.0 | 89      | 33.8  | 35   | 9.0                    |
|                                     |     |                    | 4                     | 41.5 | 96      | 51.9  | 60   | 12.0                   |
|                                     |     |                    | 5                     | 52.1 | 102     | 65.1  | 70   | 15.0                   |
|                                     |     |                    | 6*                    | 52.1 | 108     | 65.1  | 70   | 18.0                   |
|                                     |     | 240/3/60           | 3                     | 30.9 | 96      | 38.6  | 40   | 12.0                   |
|                                     |     |                    | 4                     | 47.6 | 104     | 59.5  | 60   | 16.0                   |
|                                     |     |                    | 5                     | 59.8 | 113     | 74.8  | 80   | 20.0                   |
|                                     |     |                    | 6*                    | 59.8 | 121     | 74.8  | 80   | 24.0                   |
|                                     |     | 460/3/60           | 3                     | 15.4 | 96      | 19.2  | 20   | 12.0                   |
|                                     |     |                    | 4                     | 23.7 | 104     | 29.6  | 30   | 16.0                   |
|                                     |     |                    | 5                     | 29.8 | 113     | 37.3  | 40   | 20.0                   |
|                                     |     |                    | 6*                    | 29.8 | 121     | 37.3  | 40   | 24.0                   |

**LEGEND**

**FLA** — Full Load Amps  
**LAT** — Leaving-Air Temperature at 70 F Entering-Air Temperature  
**MCA** — Unit Minimum Circuit Ampacity  
**MOCP** — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps)  
**PSC** — Permanent Split Capacitor

\*Cooling coil must be left-hand coil connections only.

**NOTES:**

1. LAT (leaving air temperature) is at maximum fan speed with entering air temperature at 70 F.
2. Face and bypass units are available only with 3 elements.
3. Electric heat is available in the reheat only position.
4. The PSC motor is not available on unit size 200.

**Table 3 — Electric Heater Data for Units with ECM Motor**

| UNIT                       | HP  | NOMINAL<br>V/Ph/Hz | NUMBER OF<br>ELEMENTS | FLA  | LAT (F) | MCA  | MOCP | TOTAL<br>CAPACITY (kW) |
|----------------------------|-----|--------------------|-----------------------|------|---------|------|------|------------------------|
| 40UV050<br>(at 500 Cfm)    | 1/3 | 208/1/60           | 3                     | 16.5 | 90      | 20.6 | 25   | 3.2                    |
|                            |     |                    | 4                     | 21.5 | 97      | 26.9 | 30   | 4.2                    |
|                            |     |                    | 5                     | 26.6 | 104     | 33.2 | 35   | 5.3                    |
|                            |     |                    | 6                     | 31.6 | 110     | 39.5 | 40   | 6.3                    |
|                            |     | 240/1/60           | 3                     | 18.8 | 97      | 23.5 | 25   | 4.2                    |
|                            |     |                    | 4                     | 24.6 | 106     | 30.8 | 35   | 5.6                    |
|                            |     |                    | 5                     | 30.5 | 115     | 38.1 | 40   | 7.0                    |
|                            |     |                    | 6                     | 36.3 | 124     | 45.4 | 50   | 8.4                    |
|                            |     | 277/1/60           | 3                     | 16.3 | 97      | 20.3 | 25   | 4.2                    |
|                            |     |                    | 4                     | 21.3 | 106     | 26.6 | 30   | 5.6                    |
|                            |     |                    | 5                     | 26.4 | 115     | 33.0 | 35   | 7.0                    |
|                            |     |                    | 6                     | 31.4 | 124     | 39.3 | 40   | 8.4                    |
|                            |     | 208/3/60           | 3                     | 10.1 | 90      | 12.6 | 15   | 3.2                    |
|                            |     |                    | 4                     | 15.1 | 97      | 18.9 | 20   | 4.2                    |
|                            |     |                    | 5                     | 18.8 | 104     | 23.5 | 25   | 5.3                    |
|                            |     |                    | 6                     | 18.8 | 110     | 23.5 | 25   | 6.3                    |
|                            |     | 240/3/60           | 3                     | 11.4 | 97      | 14.3 | 15   | 4.2                    |
|                            |     |                    | 4                     | 17.2 | 106     | 21.6 | 25   | 5.6                    |
|                            |     |                    | 5                     | 21.5 | 115     | 26.9 | 30   | 7.0                    |
|                            |     |                    | 6                     | 21.5 | 124     | 26.9 | 30   | 8.4                    |
|                            |     | 460/3/60           | 3                     | 5.4  | 97      | 6.8  | 15   | 4.2                    |
|                            |     |                    | 4                     | 8.3  | 106     | 10.4 | 15   | 5.6                    |
|                            |     |                    | 5                     | 10.5 | 115     | 13.1 | 15   | 7.0                    |
|                            |     |                    | 6                     | 10.5 | 124     | 13.1 | 15   | 8.4                    |
| 40UV,UH075<br>(at 750 Cfm) | 1/3 | 208/1/60           | 3                     | 24.0 | 89      | 30.0 | 30   | 4.5                    |
|                            |     |                    | 4                     | 31.2 | 96      | 39.0 | 40   | 6.0                    |
|                            |     |                    | 5                     | 38.4 | 102     | 48.0 | 50   | 7.5                    |
|                            |     |                    | 6                     | 45.6 | 108     | 57.0 | 60   | 9.0                    |
|                            |     | 240/1/60           | 3                     | 27.3 | 96      | 34.1 | 35   | 6.0                    |
|                            |     |                    | 4                     | 35.6 | 104     | 44.5 | 45   | 8.0                    |
|                            |     |                    | 5                     | 44.0 | 113     | 55.0 | 60   | 10.0                   |
|                            |     |                    | 6                     | 52.3 | 121     | 65.4 | 70   | 12.0                   |
|                            |     | 277/1/60           | 3                     | 23.7 | 96      | 29.6 | 30   | 6.0                    |
|                            |     |                    | 4                     | 30.9 | 104     | 38.6 | 40   | 8.0                    |
|                            |     |                    | 5                     | 38.1 | 113     | 47.6 | 50   | 10.0                   |
|                            |     |                    | 6                     | 45.3 | 121     | 56.7 | 60   | 12.0                   |
|                            |     | 208/3/60           | 3                     | 14.8 | 89      | 18.5 | 20   | 4.5                    |
|                            |     |                    | 4                     | 22.0 | 96      | 27.6 | 30   | 6.0                    |
|                            |     |                    | 5                     | 27.3 | 102     | 34.2 | 35   | 7.5                    |
|                            |     |                    | 6                     | 27.3 | 108     | 34.2 | 35   | 9.0                    |
|                            |     | 240/3/60           | 3                     | 16.8 | 96      | 20.9 | 25   | 6.0                    |
|                            |     |                    | 4                     | 25.1 | 104     | 31.4 | 35   | 8.0                    |
|                            |     |                    | 5                     | 31.2 | 113     | 39.0 | 40   | 10.0                   |
|                            |     |                    | 6                     | 31.2 | 121     | 39.0 | 40   | 12.0                   |
|                            |     | 460/3/60           | 3                     | 8.2  | 96      | 10.2 | 15   | 6.0                    |
|                            |     |                    | 4                     | 12.3 | 104     | 15.4 | 20   | 8.0                    |
|                            |     |                    | 5                     | 15.4 | 113     | 19.2 | 20   | 10.0                   |
|                            |     |                    | 6                     | 15.4 | 121     | 19.2 | 20   | 12.0                   |

**LEGEND**

|             |  |
|-------------|--|
| <b>ECM</b>  | — Electronically Commutated Motor  |
| <b>FLA</b>  | — Full Load Amps   |
| <b>LAT</b>  | — Leaving-Air Temperature at 70 F Entering-Air Temperature                   |
| <b>MCA</b>  | — Unit Minimum Circuit Ampacity  |
| <b>MOCP</b> | — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps) |

\*Cooling coil must be left-hand coil connections only.

**NOTES:**

1. LAT (leaving-air temperature) is at maximum fan speed with entering air temperature at 70 F.
2. Face and bypass units are available only with 3 elements.
3. Electric heat is available in the reheat only position.

**Table 3 — Electric Heater Data for Units with ECM Motor (cont)**

| UNIT                                | HP            | NOMINAL<br>V/Ph/Hz | NUMBER OF<br>ELEMENTS | FLA  | LAT (F) | MCA   | MOCP | TOTAL<br>CAPACITY (kW) |
|-------------------------------------|---------------|--------------------|-----------------------|------|---------|-------|------|------------------------|
| <b>40UV,UH100<br/>(at 1000 Cfm)</b> | $\frac{1}{3}$ | 208/1/60           | 3                     | 31.5 | 89      | 39.4  | 40   | 6.0                    |
|                                     |               |                    | 4                     | 41.1 | 95      | 51.4  | 60   | 8.0                    |
|                                     |               |                    | 5                     | 50.8 | 102     | 63.4  | 70   | 10.0                   |
|                                     |               |                    | 6                     | 60.4 | 108     | 75.5  | 80   | 11.9                   |
|                                     |               | 240/1/60           | 3                     | 35.9 | 96      | 44.9  | 45   | 8.0                    |
|                                     |               |                    | 4                     | 47.1 | 104     | 58.8  | 60   | 10.7                   |
|                                     |               |                    | 5                     | 58.2 | 112     | 72.7  | 80   | 13.3                   |
|                                     |               |                    | 6                     | 69.3 | 121     | 86.6  | 90   | 16.0                   |
|                                     |               | 277/1/60           | 3                     | 31.2 | 96      | 39.0  | 40   | 8.0                    |
|                                     |               |                    | 4                     | 40.8 | 104     | 51.0  | 60   | 10.7                   |
|                                     |               |                    | 5                     | 50.4 | 112     | 63.1  | 70   | 13.3                   |
|                                     |               |                    | 6                     | 60.1 | 121     | 75.1  | 80   | 16.0                   |
|                                     |               | 208/3/60           | 3                     | 19.3 | 89      | 24.1  | 25   | 6.0                    |
|                                     |               |                    | 4                     | 28.9 | 95      | 36.2  | 40   | 8.0                    |
|                                     |               |                    | 5                     | 36.0 | 102     | 45.0  | 50   | 10.0                   |
|                                     |               |                    | 6                     | 36.0 | 108     | 45.0  | 50   | 11.9                   |
|                                     |               | 240/3/60           | 3                     | 21.9 | 96      | 27.3  | 30   | 8.0                    |
|                                     |               |                    | 4                     | 33.0 | 104     | 41.2  | 45   | 10.7                   |
|                                     |               |                    | 5                     | 41.1 | 112     | 51.4  | 60   | 13.3                   |
|                                     |               |                    | 6                     | 41.1 | 121     | 51.4  | 60   | 16.0                   |
|                                     |               | 460/3/60           | 3                     | 10.6 | 96      | 13.3  | 15   | 8.0                    |
|                                     |               |                    | 4                     | 16.2 | 104     | 20.2  | 25   | 10.7                   |
|                                     |               |                    | 5                     | 20.3 | 112     | 25.3  | 30   | 13.3                   |
|                                     |               |                    | 6                     | 20.3 | 121     | 25.3  | 30   | 16.0                   |
| <b>40UV,UH125<br/>(at 1250 Cfm)</b> | $\frac{1}{2}$ | 208/1/60           | 3                     | 39.4 | 89      | 49.3  | 50   | 7.5                    |
|                                     |               |                    | 4                     | 51.5 | 96      | 64.3  | 70   | 10.0                   |
|                                     |               |                    | 5                     | 63.5 | 102     | 79.4  | 80   | 12.5                   |
|                                     |               |                    | 6*                    | 75.5 | 108     | 94.4  | 100  | 15.0                   |
|                                     |               | 240/1/60           | 3                     | 45.0 | 96      | 56.2  | 60   | 10.0                   |
|                                     |               |                    | 4                     | 58.9 | 104     | 73.6  | 80   | 13.3                   |
|                                     |               |                    | 5                     | 72.7 | 113     | 90.9  | 100  | 16.7                   |
|                                     |               |                    | 6*                    | 86.6 | 121     | 108.3 | 110  | 20.0                   |
|                                     |               | 277/1/60           | 3                     | 39.0 | 96      | 48.7  | 50   | 10.0                   |
|                                     |               |                    | 4                     | 51.0 | 104     | 63.8  | 70   | 13.3                   |
|                                     |               |                    | 5                     | 63.1 | 113     | 78.8  | 80   | 16.7                   |
|                                     |               |                    | 6*                    | 75.1 | 121     | 93.9  | 100  | 20.0                   |
|                                     |               | 208/3/60           | 3                     | 24.2 | 89      | 30.2  | 35   | 7.5                    |
|                                     |               |                    | 4                     | 36.2 | 96      | 45.3  | 50   | 10.0                   |
|                                     |               |                    | 5                     | 45.0 | 102     | 56.3  | 60   | 12.5                   |
|                                     |               |                    | 6*                    | 45.0 | 108     | 56.3  | 60   | 15.0                   |
|                                     |               | 240/3/60           | 3                     | 27.4 | 96      | 34.2  | 35   | 10.0                   |
|                                     |               |                    | 4                     | 41.3 | 104     | 51.6  | 60   | 13.3                   |
|                                     |               |                    | 5                     | 51.5 | 113     | 64.3  | 70   | 16.7                   |
|                                     |               |                    | 6*                    | 51.5 | 121     | 64.3  | 70   | 20.0                   |
|                                     |               | 460/3/60           | 3                     | 13.2 | 96      | 16.5  | 20   | 10.0                   |
|                                     |               |                    | 4                     | 20.2 | 104     | 25.2  | 30   | 13.3                   |
|                                     |               |                    | 5                     | 25.3 | 113     | 31.6  | 35   | 16.7                   |
|                                     |               |                    | 6*                    | 25.3 | 121     | 31.6  | 35   | 20.0                   |

**LEGEND**

**ECM** — Electronically Commutated Motor  
**FLA** — Full Load Amps  
**LAT** — Leaving-Air Temperature at 70 F Entering-Air Temperature  
**MCA** — Unit Minimum Circuit Ampacity  
**MOCP** — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps)

\*Cooling coil must be left-hand coil connections only

**NOTES:**

1. LAT (leaving air temperature) is at maximum fan speed with entering air temperature at 70 F.
2. Face and bypass units are available only with 3 elements.
3. Electric heat is available in the reheat only position.



**Table 3 — Electric Heater Data for Units with ECM Motor (cont)**

| UNIT                                | HP            | NOMINAL<br>V/Ph/Hz | NUMBER OF<br>ELEMENTS | FLA  | LAT (F) | MCA   | MOCP | TOTAL<br>CAPACITY (kW) |
|-------------------------------------|---------------|--------------------|-----------------------|------|---------|-------|------|------------------------|
| <b>40UV,UH150<br/>(at 1500 Cfm)</b> | $\frac{1}{2}$ | 208/1/60           | 3                     | 46.7 | 89      | 58.3  | 60   | 9.0                    |
|                                     |               |                    | 4                     | 61.1 | 96      | 76.4  | 80   | 12.0                   |
|                                     |               |                    | 5                     | 75.6 | 102     | 94.4  | 100  | 15.0                   |
|                                     |               |                    | 6*                    | 90.0 | 108     | 112.5 | 125  | 18.0                   |
|                                     |               | 240/1/60           | 3                     | 53.3 | 96      | 66.6  | 70   | 12.0                   |
|                                     |               |                    | 4                     | 70.0 | 104     | 87.5  | 90   | 16.0                   |
|                                     |               |                    | 5                     | 86.6 | 113     | 108.3 | 110  | 20.0                   |
|                                     |               |                    | 6                     | —    | —       | —     | —    | —                      |
|                                     |               | 277/1/60           | 3                     | 46.2 | 96      | 57.8  | 60   | 12.0                   |
|                                     |               |                    | 4                     | 60.7 | 104     | 75.8  | 80   | 16.0                   |
|                                     |               |                    | 5                     | 75.1 | 113     | 93.9  | 100  | 20.0                   |
|                                     |               |                    | 6                     | —    | —       | —     | —    | —                      |
|                                     |               | 208/3/60           | 3                     | 28.3 | 89      | 35.4  | 40   | 9.0                    |
|                                     |               |                    | 4                     | 42.8 | 96      | 53.5  | 60   | 12.0                   |
|                                     |               |                    | 5                     | 53.4 | 102     | 66.7  | 70   | 15.0                   |
|                                     |               |                    | 6*                    | 53.4 | 108     | 66.7  | 70   | 18.0                   |
|                                     |               | 240/3/60           | 3                     | 32.2 | 96      | 40.3  | 45   | 12.0                   |
|                                     |               |                    | 4                     | 48.9 | 104     | 61.1  | 70   | 16.0                   |
|                                     |               |                    | 5                     | 61.1 | 113     | 76.4  | 80   | 20.0                   |
|                                     |               |                    | 6*                    | 61.1 | 121     | 76.4  | 80   | 24.0                   |
|                                     |               | 460/3/60           | 3                     | 15.6 | 96      | 19.5  | 20   | 12.0                   |
|                                     |               |                    | 4                     | 24.0 | 104     | 30.0  | 30   | 16.0                   |
|                                     |               |                    | 5                     | 30.1 | 113     | 37.6  | 40   | 20.0                   |
|                                     |               |                    | 6*                    | 30.1 | 121     | 37.6  | 40   | 24.0                   |
| <b>40UH200<br/>(at 2000 Cfm)</b>    | $\frac{3}{4}$ | 208/1/60           | 3                     | 50.1 | 84      | 62.7  | 70   | 9.0                    |
|                                     |               |                    | 4                     | 64.6 | 89      | 80.7  | 90   | 12.0                   |
|                                     |               |                    | 5                     | 79.0 | 94      | 98.8  | 100  | 15.0                   |
|                                     |               |                    | 6*                    | 93.5 | 99      | 116.8 | 125  | 18.0                   |
|                                     |               | 240/1/60           | 3                     | 56.8 | 89      | 71.0  | 80   | 12.0                   |
|                                     |               |                    | 4                     | 73.5 | 96      | 91.8  | 100  | 16.0                   |
|                                     |               |                    | 5                     | 90.1 | 102     | 112.7 | 125  | 20.0                   |
|                                     |               |                    | 6                     | —    | —       | —     | —    | —                      |
|                                     |               | 277/1/60           | 3                     | 48.8 | 89      | 61.0  | 70   | 12.0                   |
|                                     |               |                    | 4                     | 63.3 | 96      | 79.1  | 80   | 16.0                   |
|                                     |               |                    | 5                     | 77.7 | 102     | 97.1  | 100  | 20.0                   |
|                                     |               |                    | 6                     | —    | —       | —     | —    | —                      |
|                                     |               | 208/3/60           | 3                     | 31.8 | 84      | 39.8  | 40   | 9.0                    |
|                                     |               |                    | 4                     | 46.3 | 89      | 57.9  | 60   | 12.0                   |
|                                     |               |                    | 5                     | 56.9 | 94      | 71.1  | 80   | 15.0                   |
|                                     |               |                    | 6*                    | 56.9 | 99      | 71.1  | 80   | 18.0                   |
|                                     |               | 240/3/60           | 3                     | 35.7 | 89      | 44.6  | 45   | 12.0                   |
|                                     |               |                    | 4                     | 52.4 | 96      | 65.5  | 70   | 16.0                   |
|                                     |               |                    | 5                     | 64.6 | 102     | 80.8  | 90   | 20.0                   |
|                                     |               |                    | 6*                    | 64.6 | 108     | 80.8  | 90   | 24.0                   |
|                                     |               | 460/3/60           | 3                     | 16.9 | 89      | 21.1  | 25   | 12.0                   |
|                                     |               |                    | 4                     | 25.2 | 96      | 31.5  | 35   | 16.0                   |
|                                     |               |                    | 5                     | 31.3 | 102     | 39.1  | 40   | 20.0                   |
|                                     |               |                    | 6*                    | 31.3 | 108     | 39.1  | 40   | 24.0                   |

**LEGEND**

**ECM** — Electronically Commutated Motor  
**FLA** — Full Load Amps  
**LAT** — Leaving-Air Temperature at 70 F Entering-Air Temperature  
**MCA** — Unit Minimum Circuit Ampacity  
**MOCP** — Maximum Overcurrent Protection (Maximum Fuse Size or Circuit Breaker Amps)

\*Cooling coil must be left-hand coil connections only.

**NOTES:**

1. LAT (leaving air temperature) is at maximum fan speed with entering air temperature at 70 F.
2. Face and bypass units are available only with 3 elements.
3. Electric heat is available in the reheat only position.

**Table 4 — Motor Data**

**PSC Motor Data**

| UNIT 40UV,UH SIZE | MOTOR Hp      | VOLTAGE | FLA | MCA | MOP (Amps) | MAX FUSE SIZE (Amps) |
|-------------------|---------------|---------|-----|-----|------------|----------------------|
| <b>050*</b>       | $\frac{1}{5}$ | 115     | 3.7 | 4.6 | 8.3        | 15                   |
|                   |               | 208/230 | 2.0 | 2.5 | 4.5        | 15                   |
|                   |               | 265     | 1.6 | 2.0 | 3.6        | 15                   |
| <b>075</b>        | $\frac{1}{5}$ | 115     | 3.7 | 4.6 | 8.3        | 15                   |
|                   |               | 208/230 | 2.0 | 2.5 | 4.5        | 15                   |
|                   |               | 265     | 1.6 | 2.0 | 3.6        | 15                   |
| <b>100</b>        | $\frac{1}{5}$ | 115     | 3.7 | 4.6 | 8.3        | 15                   |
|                   |               | 208/230 | 2.0 | 2.5 | 4.5        | 15                   |
|                   |               | 265     | 1.6 | 2.0 | 3.6        | 15                   |
| <b>125</b>        | $\frac{1}{5}$ | 115     | 3.7 | 4.6 | 8.3        | 15                   |
|                   |               | 208/230 | 2.0 | 2.5 | 4.5        | 15                   |
|                   |               | 265     | 1.6 | 2.0 | 3.6        | 15                   |
| <b>150</b>        | $\frac{1}{5}$ | 115     | 3.7 | 4.6 | 8.3        | 15                   |
|                   |               | 208/230 | 2.0 | 2.5 | 4.5        | 15                   |
|                   |               | 265     | 1.6 | 2.0 | 3.6        | 15                   |

**ECM Motor Data**

| UNIT 40UV,UH SIZE | MOTOR Hp      | VOLTAGE | FLA | MCA  | MOP (Amps) | MAX FUSE SIZE (Amps) |
|-------------------|---------------|---------|-----|------|------------|----------------------|
| <b>050*</b>       | $\frac{1}{3}$ | 115     | 1.4 | 1.8  | 3.1        | 15                   |
|                   |               | 208/230 | 1.3 | 1.6  | 2.9        | 15                   |
|                   |               | 265     | 1.1 | 1.4  | 2.6        | 15                   |
| <b>075</b>        | $\frac{1}{3}$ | 115     | 3.7 | 4.6  | 8.3        | 15                   |
|                   |               | 208/230 | 2.3 | 2.9  | 5.1        | 15                   |
|                   |               | 265     | 2.0 | 2.5  | 4.5        | 15                   |
| <b>100</b>        | $\frac{1}{3}$ | 115     | 4.0 | 5.0  | 9.1        | 15                   |
|                   |               | 208/230 | 2.6 | 3.2  | 5.8        | 15                   |
|                   |               | 265     | 2.3 | 2.9  | 5.1        | 15                   |
| <b>125</b>        | $\frac{1}{2}$ | 115     | 4.7 | 5.9  | 10.6       | 15                   |
|                   |               | 208/230 | 3.3 | 4.1  | 7.4        | 15                   |
|                   |               | 265     | 2.9 | 3.6  | 6.6        | 15                   |
| <b>150</b>        | $\frac{1}{2}$ | 115     | 4.7 | 5.9  | 10.6       | 15                   |
|                   |               | 208/230 | 3.3 | 4.1  | 7.4        | 15                   |
|                   |               | 265     | 2.9 | 3.6  | 6.6        | 15                   |
| <b>200†</b>       | $\frac{3}{4}$ | 115     | 9.6 | 12.0 | 21.6       | 20                   |
|                   |               | 208/230 | 6.8 | 8.5  | 15.3       | 15                   |
|                   |               | 265     | 5.5 | 6.9  | 12.4       | 15                   |

**LEGEND**

**ECM** — Electronically Commutated Motor  
**FLA** — Full Load Amps  
**MCA** — Minimum Circuit Amps  
**MOP** — Maximum Overload Protection  
**PSC** — Permanent Split Capacitor

\*Available in vertical configuration only.

†Available in horizontal configuration only.

NOTE: The PSC motor is not available on unit size 200.

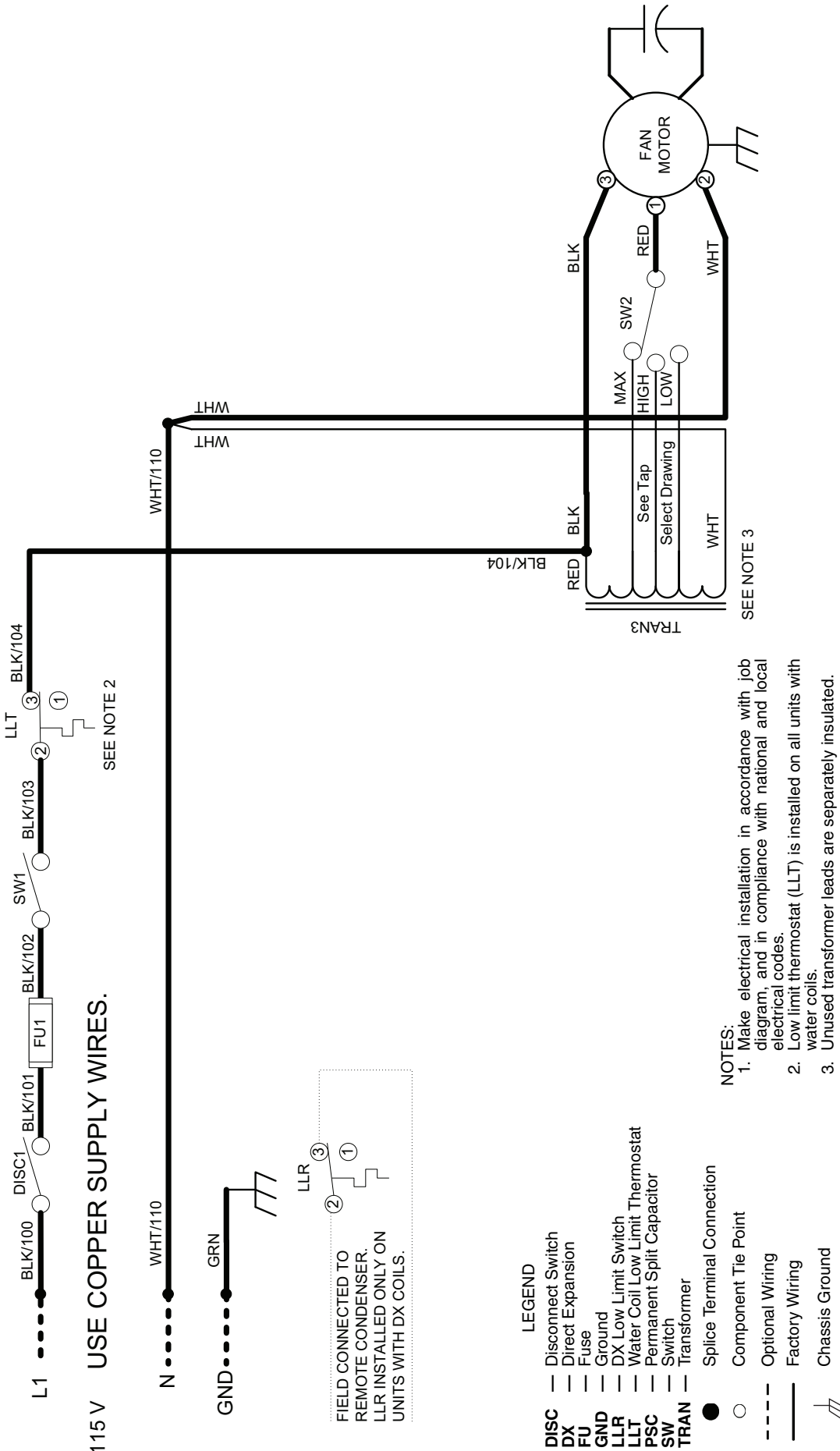


Fig. 12 — 115-v PSC Motor without Controls

## USE COPPER SUPPLY WIRES.

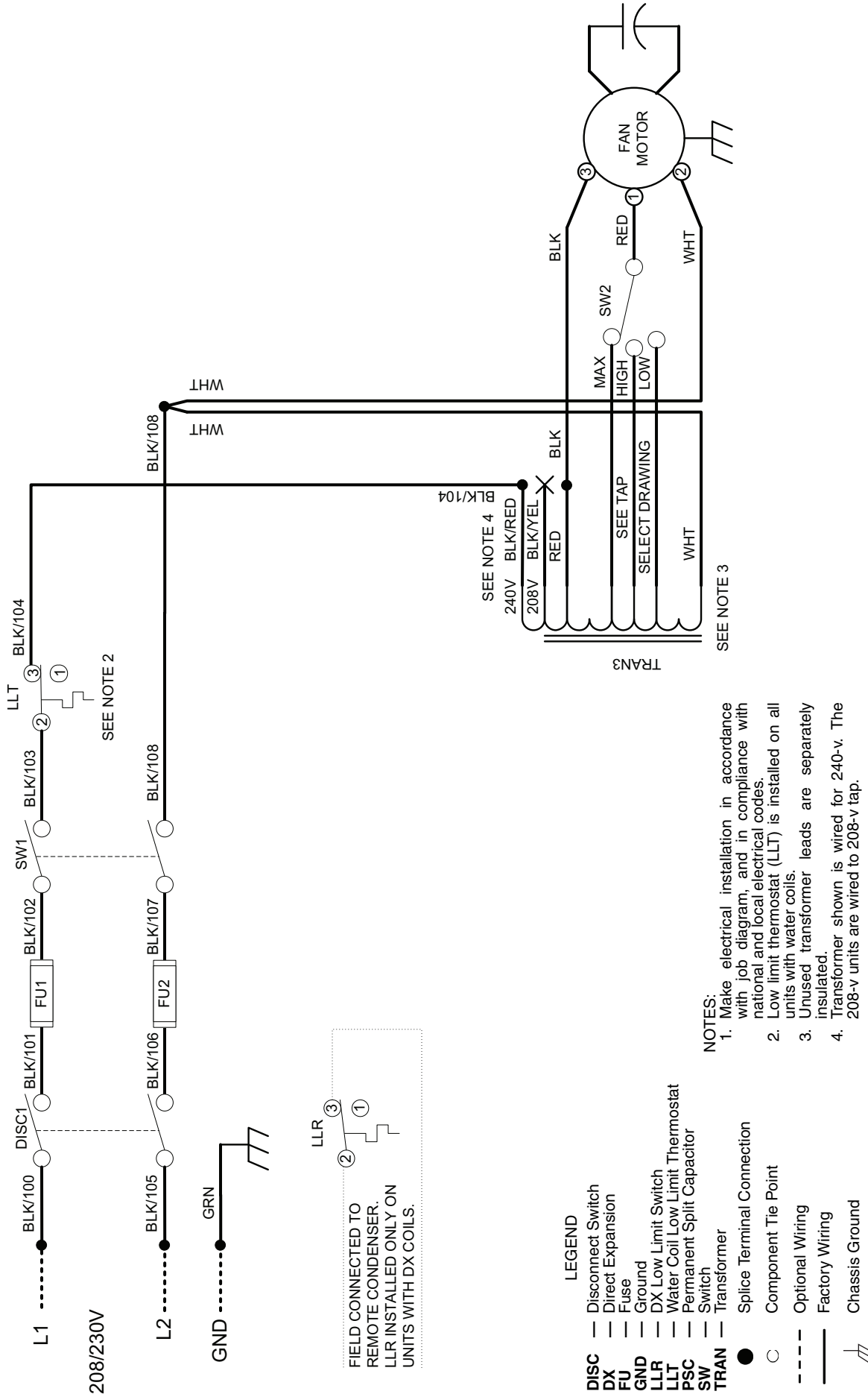


Fig. 13 — 208/230-v PSC Motor without Controls

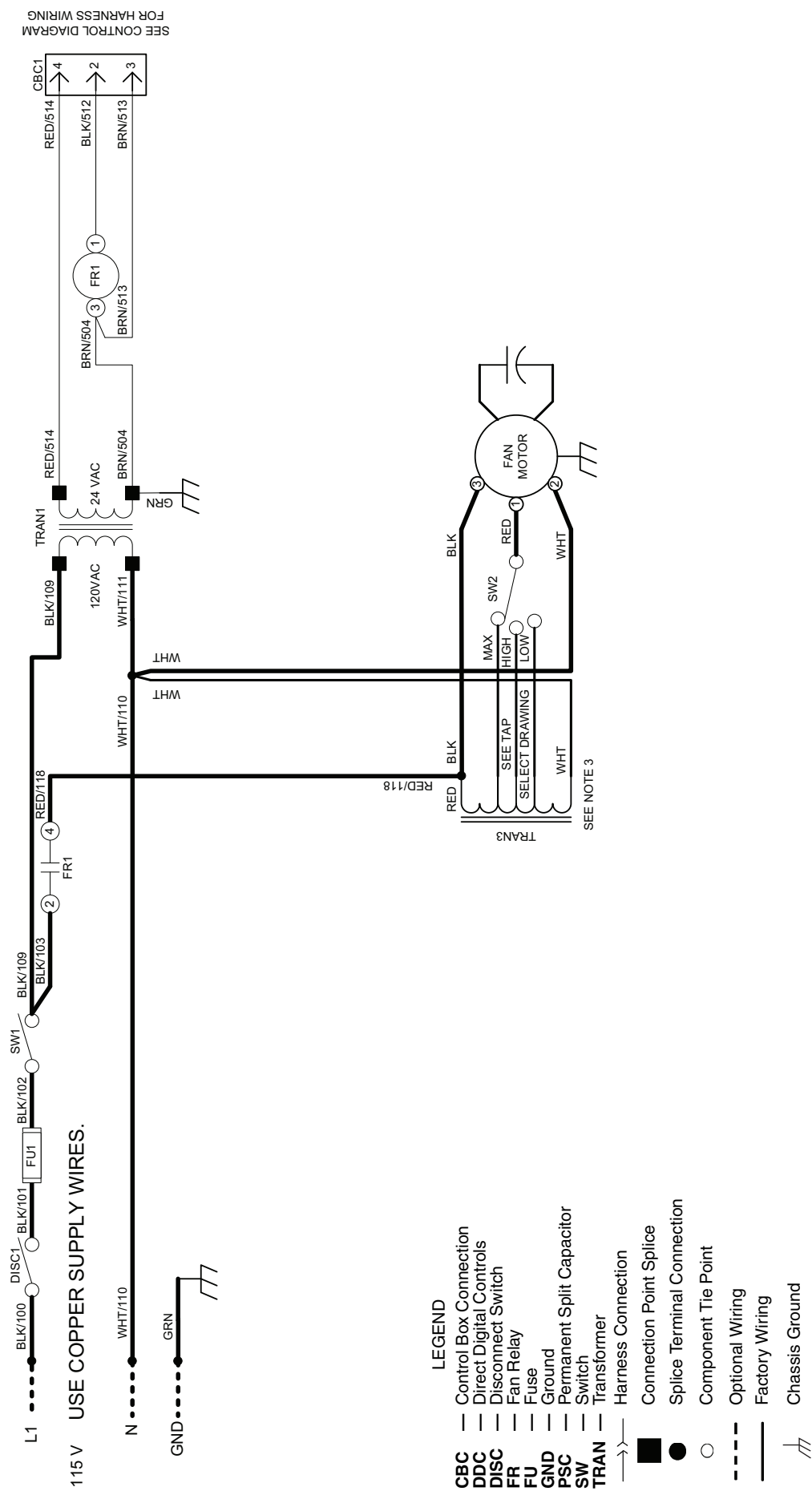


Fig. 14 — 115-v PSC Motor with DDC Ready Option

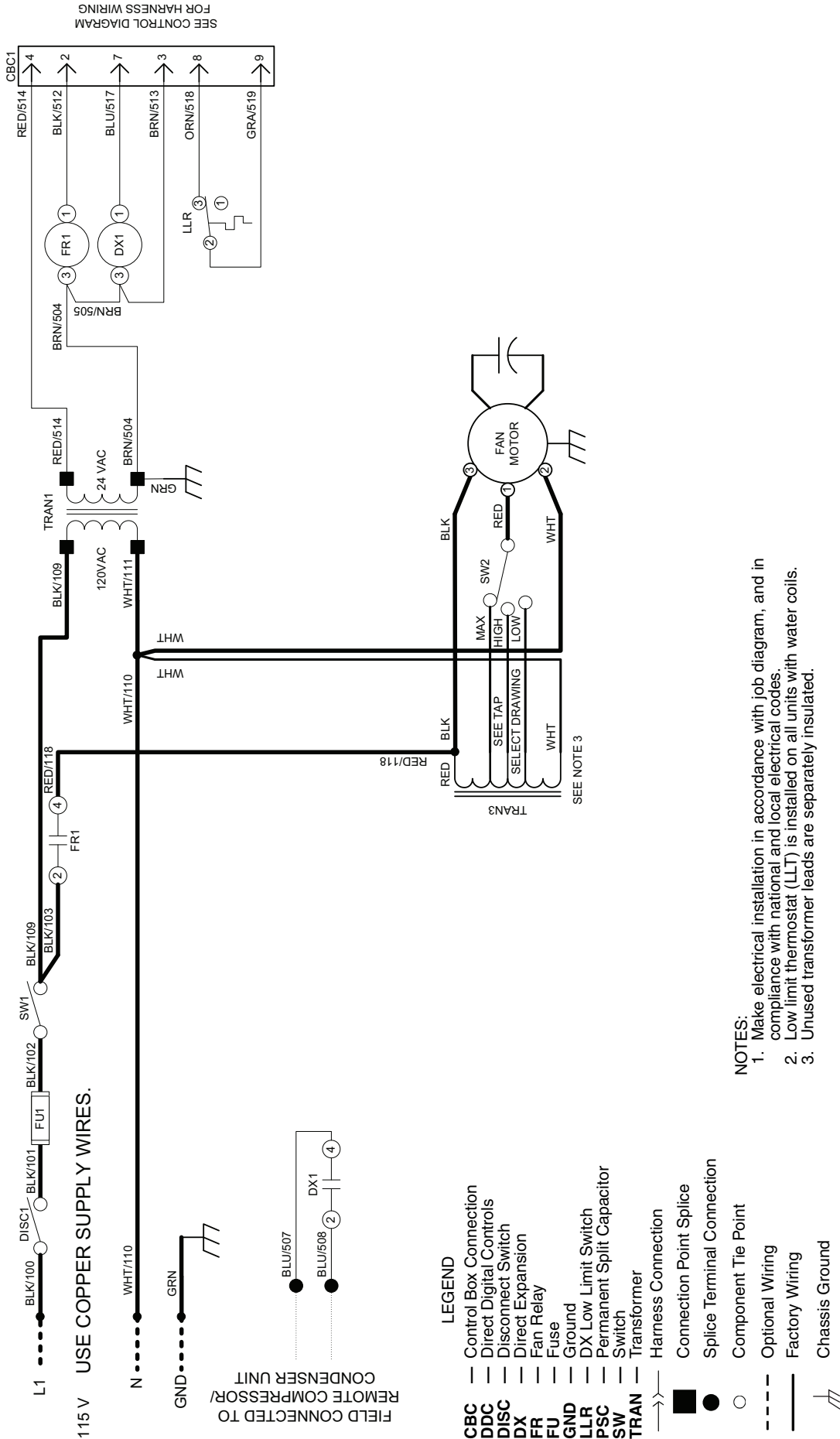


Fig. 15 — 115-v PSC Motor with DDC Ready Option and DX Cooling

# USE COPPER SUPPLY WIRES.

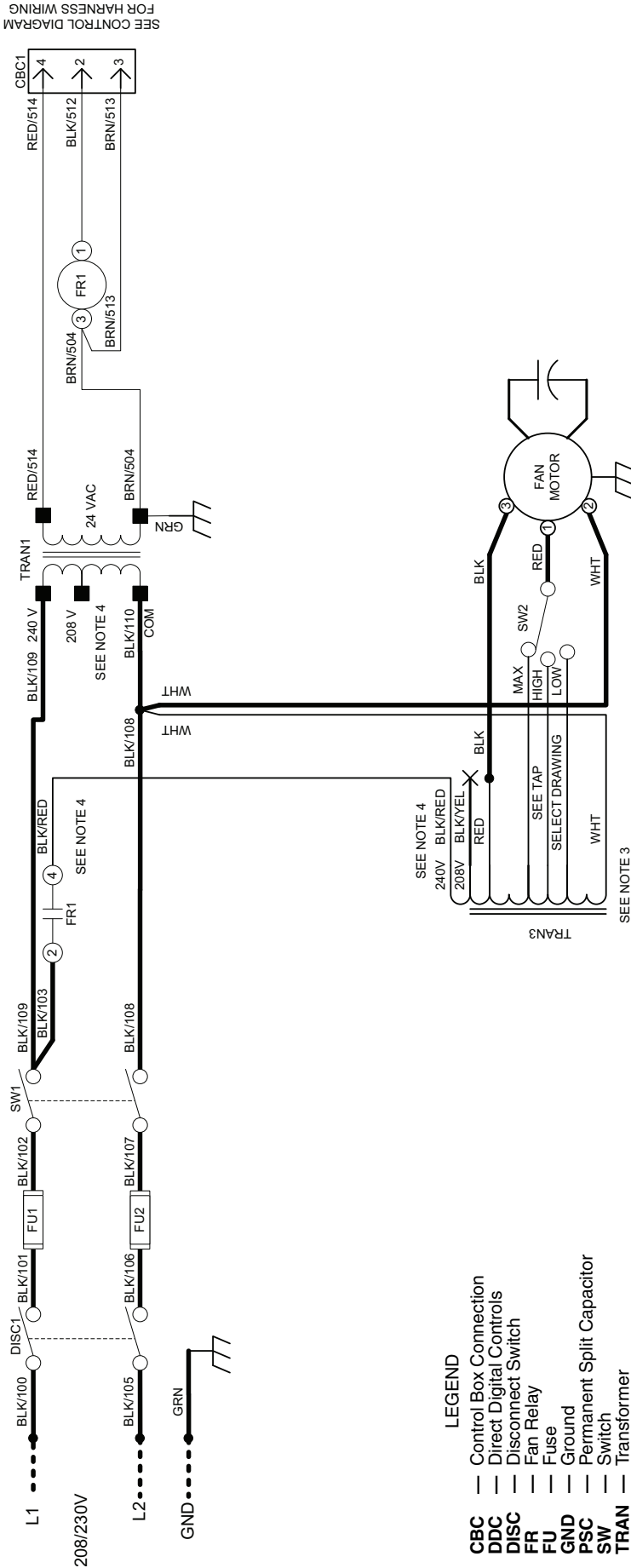
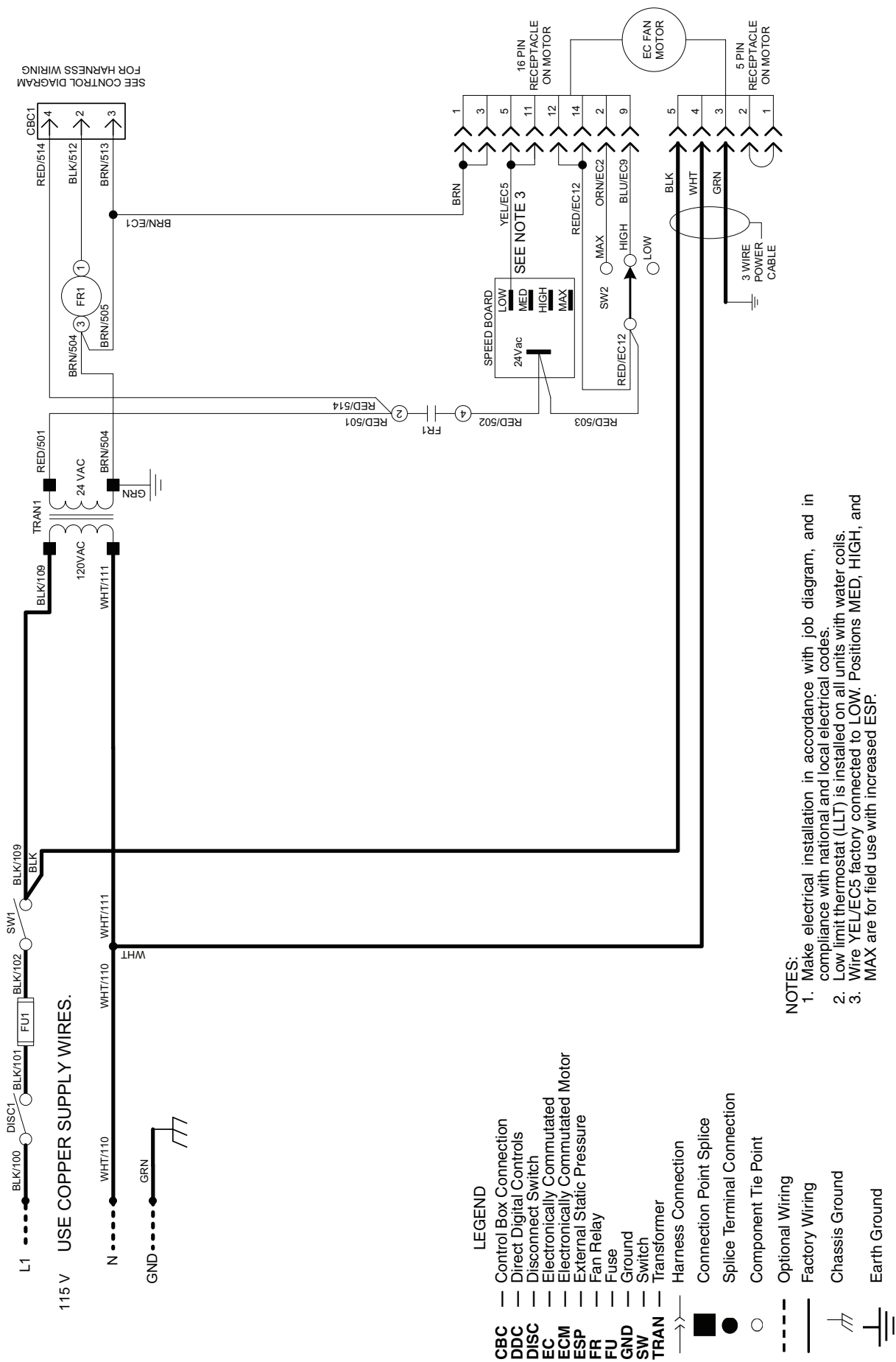


Fig. 16 — 208/230-v PSC Motor with DDC Ready Option

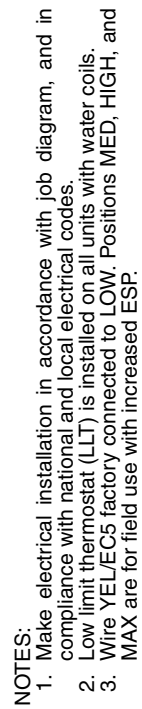




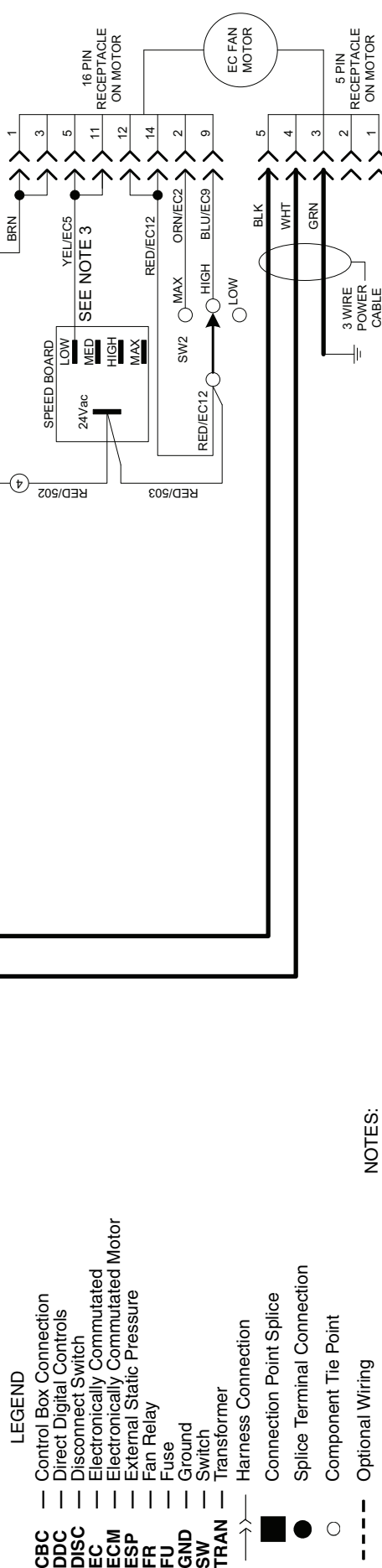




**Fig. 19 — 115-v ECM Motor with DDC Ready Controls**



**Fig. 20 — 115-v ECM Motor with DDC Ready Controls and DX Cooling**

[illegible]

1. Make electrical installation in accordance with job diagram, and in compliance with national and local electrical codes.
2. Low limit thermostat (LLT) is installed on all units with water coils.
3. Wire YEL/EC5 factory connected to LOW. Positions MED, HIGH, and MAX are for field use with increased ESP.
4. Transformers shown wired for 240-v; however, transformers are normally factory wired to match voltage listed on the unit nameplate.

**Fig. 21 — 208/230-v ECM Motor with DDC Ready Controls**



**Step 5 — Make Duct Connections** — If applicable, install all ductwork to and from unit in accordance with all applicable codes. Duct construction must allow unit to operate within duct external static pressure limits as shown on job submittals and in Tables 5 and 6. Duct opening should be the same size as the unit. For 40UH units ducted to multiple openings, allow adequate straight duct, as shown below, immediately after the unit.

| 40UH  | 075 | 100 | 125 | 150 | 200 |
|---|-----|-----|-----|-----|-----|
| Minimum Straight Duct Required (Length in inches) | 45  | 52  | 58  | 63  | 75  |

**⚠ CAUTION**

Units designed to operate with ductwork may be damaged if operated without intended ductwork attached.

Ensure that units ducted to multiple openings have sufficient straight duct immediately after the unit.

Units provided with outside air must utilize the low-temperature safety switch to prevent coil freeze-up.

Insulate all ductwork as required. Use flexible connections to minimize duct-to-unit alignment problems and noise transmission where specified.

Install ductwork, grilles, and plenums so that they do not restrict access to filter.

Cut openings for supply and return air grilles, thermostats, and switch plates where specified on job drawings. Be careful not to cut wires, piping, or structural supports. Use a steel thermostat shield ring to protect drywall from thermostat wiring where applicable.

Prevent dust and debris from settling in unit. If wall finish or color is to be applied by spraying, cover all openings to prevent spray from entering unit.

**Table 5 — Unit Ventilator Airflow — PSC Motor\***

| FACTORY SETTINGS — CHILLED WATER COIL APPLICATIONS    |       |                                |       |       |       |       |       |       |
|---|-------|--------------------------------|-------|-------|-------|-------|-------|-------|
| Unit  | Speed | Approximate Air Delivery (Cfm) |       |       |       |       |       |       |
|   |       | 1-row                          | 2-row | 3-row | 4-row | 5-row | 6-row | 7-row |
| 40UV050   | Max   | 522                            | 510   | 497   | 485   | 490   | 489   | 457   |
|   | High  | 503                            | 490   | 476   | 464   | 473   | 476   | 444   |
|   | Low   | 458                            | 449   | 440   | 425   | 452   | 455   | 430   |
| 40UV,UH075  | Max   | 806                            | 778   | 750   | 747   | 766   | 732   | 697   |
|   | High  | 682                            | 664   | 645   | 629   | 621   | 596   | 570   |
|   | Low   | 569                            | 554   | 539   | 527   | 533   | 514   | 495   |
| 40UV,UH100  | Max   | 1064                           | 1033  | 1001  | 1013  | 973   | 980   | 967   |
|   | High  | 662                            | 659   | 655   | 642   | 763   | 740   | 717   |
|   | Low   | 530                            | 519   | 507   | 503   | 498   | 501   | 504   |
| 40UV,UH125  | Max   | 1295                           | 1285  | 1215  | 1218  | 1239  | 1250  | 1175  |
|   | High  | 899                            | 930   | 876   | 865   | 852   | 846   | 846   |
|   | Low   | 568                            | 616   | 597   | 570   | 568   | 558   | 573   |
| 40UV,UH150  | Max   | 1542                           | 1480  | 1500  | 1484  | 1468  | 1482  | 1374  |
|   | High  | 1071                           | 1068  | 1065  | 1034  | 1033  | 1031  | 1013  |
|   | Low   | 812                            | 801   | 790   | 881   | 848   | 842   | 799   |
| FACTORY SETTINGS — ELECTRIC HEAT/DX COIL APPLICATIONS |       |                                |       |       |       |       |       |       |
| Unit  | Speed | Approximate Air Delivery (Cfm) |       |       |       |       |       |       |
|   |       | 1-row                          | 2-row | 3-row | 4-row | 5-row | 6-row | 7-row |
| 40UV050   | Max   | 522                            | 510   | 497   | 485   | 490   | 489   | 457   |
|   | High  | 503                            | 490   | 476   | 464   | 452   | 455   | 430   |
|   | Low   | 458                            | 449   | 440   | 425   | 410   | 414   | 406   |
| 40UV,UH075  | Max   | 806                            | 778   | 750   | 747   | 766   | 732   | 697   |
|   | High  | 682                            | 664   | 645   | 629   | 621   | 596   | 570   |
|   | Low   | 569                            | 554   | 539   | 527   | 533   | 514   | 495   |
| 40UV,UH100  | Max   | 1064                           | 1033  | 1001  | 1013  | 973   | 980   | 967   |
|   | High  | 794                            | 788   | 782   | 773   | 857   | 834   | 810   |
|   | Low   | 662                            | 659   | 655   | 642   | 628   | 620   | 611   |
| 40UV,UH125  | Max   | 1295                           | 1285  | 1215  | 1218  | 1239  | 1250  | 1175  |
|   | High  | 1055                           | 1040  | 1024  | 995   | 1099  | 1091  | 1052  |
|   | Low   | 738                            | 767   | 732   | 719   | 987   | 986   | 964   |
| 40UV,UH150  | Max   | 1542                           | 1480  | 1500  | 1484  | 1468  | 1482  | 1374  |
|   | High  | 1285                           | 1257  | 1229  | 1248  | 1246  | 1239  | 1199  |
|   | Low   | 934                            | 928   | 922   | 901   | 1033  | 1031  | 1013  |

**LEGEND**

**CW** — Chilled Water Applications  
**DX** — Direct Expansion  
**HW** — Hot Water  
**PSC** — Permanent Split Capacitor

\*Standard on sizes 050-150.

NOTE: Use the table below to determine the heating and cooling coil combinations available with PSC motor operation.

| COOLING COIL     | HEATING COIL |             |                 |
|------------------|--------------|-------------|-----------------|
|                  | HW           | Steam       | Electric        |
| 5 Rows CW        | 1 or 2 rows  | N/A         | 3 elements      |
| 4 Rows CW or DX† | 3 rows       | 1 or 2 rows | 4 elements      |
| 3 Rows CW        | 4 rows       | 1 or 2 rows | 5 or 6 elements |

†DX cooling applications are only available in 4-row cooling configuration.

**Table 6 — Unit Ventilator Airflow — ECM Airflow**

| UNIT SIZE  | MOTOR HP | COIL TYPE | APPROXIMATE AIR DELIVERY (Cfm) |      |      |                               |      |      |                                |      |      |                               |      |      |
|------------|----------|-----------|--------------------------------|------|------|-------------------------------|------|------|--------------------------------|------|------|-------------------------------|------|------|
|            |          |           | ESP Speed Board Position       |      |      |                               |      |      |                                |      |      |                               |      |      |
|            |          |           | Low Position<br>(0.0 in. wg)   |      |      | Med Position<br>(0.10 in. wg) |      |      | High Position<br>(0.25 in. wg) |      |      | Max Position<br>(0.45 in. wg) |      |      |
|            |          |           | Max                            | High | Low  | Max                           | High | Low  | Max                            | High | Low  | Max                           | High | Low  |
| 40UV050    | 1/3      | CW        | 499                            | 336  | 248  | —                             | —    | —    | —                              | —    | —    | —                             | —    | —    |
|            |          | 3-4EH/DX  | 499                            | 419  | 336  | —                             | —    | —    | —                              | —    | —    | —                             | —    | —    |
|            |          | 5-6EH     | 491                            | 380  | 324  | —                             | —    | —    | —                              | —    | —    | —                             | —    | —    |
| 40UV,UH075 | 1/3      | CW        | 747                            | 484  | 346  | 753                           | 548  | 432  | 752                            | 530  | 427  | 751                           | 541  | 386  |
|            |          | 3-4EH/DX  | 747                            | 644  | 498  | 753                           | 609  | 472  | 752                            | 612  | 470  | 751                           | 618  | 498  |
|            |          | 5-6EH     | 755                            | 645  | 583  | 746                           | 598  | 539  | 755                            | 585  | 554  | 765                           | 610  | 542  |
| 40UV,UH100 | 1/3      | CW        | 997                            | 703  | 505  | 987                           | 693  | 543  | 1012                           | 663  | 483  | 994                           | 692  | 480  |
|            |          | 3-4EH/DX  | 997                            | 853  | 615  | 987                           | 850  | 639  | 1012                           | 823  | 626  | 994                           | 819  | 618  |
|            |          | 5-6EH     | 1016                           | 819  | 719  | 1002                          | 851  | 709  | 1024                           | 798  | 787  | 1024                          | 820  | 734  |
| 40UV,UH125 | 1/2      | CW        | 1266                           | 880  | 657  | 1239                          | 905  | 609  | 1235                           | 898  | 676  | 1231                          | 898  | 627  |
|            |          | 3-4EH/DX  | 1266                           | 1023 | 769  | 1239                          | 1055 | 758  | 1235                           | 1037 | 765  | 1231                          | 1010 | 778  |
|            |          | 5-6EH     | 1259                           | 1049 | 897  | 1239                          | 995  | 888  | 1226                           | 995  | 888  | 1253                          | 994  | 919  |
| 40UV,UH150 | 1/2      | CW        | 1503                           | 1033 | 775  | 1479                          | 1046 | 712  | 1494                           | 1020 | 770  | 1486                          | 1075 | 737  |
|            |          | 3-4EH/DX  | 1503                           | 1246 | 956  | 1479                          | 1216 | 965  | 1494                           | 1209 | 927  | 1486                          | 1222 | 917  |
|            |          | 5-6EH     | 1517                           | 1222 | 1068 | 1490                          | 1206 | 1087 | 1498                           | 1159 | 1120 | 1503                          | 1188 | 1074 |
| 40UH200    | 3/4      | ALL       | 2014                           | 1384 | 1023 | 1981                          | 1386 | 971  | 1965                           | 1385 | 997  | 1814                          | 1354 | 993  |

**LEGEND**

**3-4EH/DX** — Direct Expansion Coil Applications with 3 to 4 Elements of Electric Heat  
**5-6EH** — 5 to 6 Elements of Electric Heat  
**CW** — Chilled Water Applications  
**ECM** — Electronically Commutated Motor  
**ESP** — External Static Pressure

**NOTES:**

1. Factory default is Low Position.
2. Med, High, and Max positions are field settings.

**Step 6 — Make Final Preparations**

1. Turn power off (lock out and tag electrical disconnect).
2. Install thermostats and perform any other final wiring as applicable.
3. Clean dirt, dust, and other construction debris from unit interior. Be sure to check fan wheel and housing.
4. Rotate fan wheel by hand to be sure it is free and does not rub on housing.
5. Be sure drain line is clear and is properly and securely positioned. Pour water into drain to check operation.
6. Vent all air from unit coil and related piping. The coil is provided with a Schrader or screw-type manual air vent on the return manifold to release air from the coil.

NOTE: This vent is not adequate for removing air from the building piping system. Customer must provide for venting of the piping system.

- a. Pressurize the building piping system with water. Vent trapped air at system vents.
- b. Schrader type vent: Remove cap. Depress valve at coil vent until air is expelled from the unit. Release valve. Reinstall cap.
- c. Screw type vent: Back out manual setscrew until air is expelled. Retighten setscrew.
- d. Automatic type vent: Trapped air will be vented automatically. Vent releases air slowly, usually dripping water into the drain pan in the process.

Make sure all service valves are open and that motorized control valves, if supplied, are set for automatic operation.

7. Check all control valves in the system for proper operation in accordance with valve manufacturer's instructions.

8. Install filter in frame at front of coil. If field-supplied filters are used, be sure size is correct. See Table 1 for filter data.
9. Ensure all panels and filters are installed before checking fan operation. Turn on unit power. Check fan and motor operation.

**IMPORTANT:** Do not start up or operate unit without filter and panels installed. Be sure filter and unit interior are clean.

**START-UP**

Start-up procedures vary depending on time of year (summer or winter) and building characteristics (new building/old building, occupied/unoccupied, etc.). All building windows and door should be closed before starting the unit. Close the unit's outdoor air dampers. Bathroom and kitchen exhaust fans should be off.

Start-up in the Cooling mode requires proper care to avoid condensation problems. Condensation forms on surfaces that are colder than the dew point of the surrounding air. If a unit is started and is piped with low-temperature chilled water in a hot, humid atmosphere, condensation will form on many parts of the unit. In order to avoid excessive condensation, higher temperature water should initially be used (approximately 65 to 70 F), reduce the chilled water flow rate (GPM) and set the fan to high speed for maximum airflow.

As the building temperature drops, the chilled water temperature can be gradually reduced until it reaches 50 F. At this point the outside-air damper can be opened to take in minimum outside air. When the chilled water temperature is reduced to its design point, the exhaust fans can be turned on.

Maximum entering water temperature is 180 F, unless nameplate indicates 200 F.

### ⚠ CAUTION

If unit is marked for 200 F maximum entering water temperature, customer must ensure that water vaporization does not occur, especially at higher elevations when entering water temperatures are greater than 190 F.

### ⚠ CAUTION

Ensure that the unit is protected against freezing conditions. If locking quadrant manual damper operator is provided, set to desired position. If damper actuator is provided, ensure that actuator opens the damper when the fan turns on, and closes when the fan stops.

## SERVICE

### ⚠ WARNING

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

## Periodic Maintenance Checklist

### Monthly

- Inspect air filter. Replace any filters.
- Inspect drain pan and clean if necessary.

### Yearly

- Inspect and clean coils.
- Inspect fan wheels and housing for damage. Ensure that wheels move freely by hand.
- Clean and tighten all electrical connections.

## Preventing Excessive Condensation on Unit —

Excessive condensation can be caused by running chilled water through a unit with the unit fan off. If fan cycling is used, a water flow control valve should be installed to shut off the water when the fan stops.

Other methods of control which avoid condensation problems are as follows:

1. If condensation is forming on the unit, verify the chilled water valve is closing off tightly. Dirt or debris may prevent the valve from closing completely.
2. Continuous fan operation with motorized chilled water valve controlled by a thermostat.
3. Continuous fan operation with thermostat control to switch fan from high to low speed (instead of off).

**Check Drain —** Check drain pan, drain line, and trap at start of each cooling season. A standard type pipe cleaner for  $\frac{3}{4}$ -in. ID pipe can be used to be sure pipe is clear of obstruction so that condensate is carried away. Check the drain line at filter cleaning time during the cooling season. Be sure that debris has not fallen into unit through supply air grille.

**Fan Motor Bearings —** Standard motors are permanent split capacitor, which are equipped with permanently sealed and lubricated bearings. No lubrication is required unless special motors have been supplied or unusual operating conditions exist.

**Fan Shaft Ball Bearing —** The mid and inboard bearings are permanently sealed and lubricated. No additional maintenance is required. The end bearings must be lubricated at

the start of each cooling and heating season. Add 5 to 10 drops of SAE 20 or 30 non-detergent based oil to the bearing.

**Clean Fan Wheel —** For access to fan assembly, remove discharge grille (if supplied). If unit is connected to ductwork, remove front (40UV) or bottom (40UH) panel, separate fan shaft from motor at bushing, remove motor, and slide fan assembly from track. Use a stiff brush or vacuum to remove dirt and debris from scroll. Wipe all fan surfaces with a damp cloth. Reassemble as necessary.

**Clean or Replace Air Filters —** At the start of each cooling season and after each month of operation (more or less depending on operating conditions), replace throwaway filter or clean permanent filter.

**THROWAWAY FILTER —** Replace filter with a good quality filter of the correct size. Do not attempt to clean and reuse disposable filters. See Table 1 for filter sizes.

**PERMANENT FILTER (FIBER TYPE)**

1. Tap on solid surface to dislodge heavy particles.
2. Wash in hot water. If needed, use mild solution of commercial solvent such as sal soda or trisodium phosphate.
3. Set filter on end so that water drains out through slots in frame. Allow filter to dry thoroughly.
4. Recharge filter with recharging oil. Three ounces is sufficient for a medium size filter. Oil may be applied by insect spray gun. For easier spraying, the oil can be warmed. If the filter is dipped in the recharging oil, remove it immediately and allow to drain through slots in frame.
5. Replace filter in unit.

If another type of filter is used, follow the filter manufacturer's instructions.

**ECM Motor Removal and Reinstallation (Fig. 23) —** Carrier unit ventilators utilize an electronically commutated motor (ECM) to drive the indoor fan.

The ECM is a factory-programmed motor that is standard with factory-supplied UV Open controls and units without factory-supplied controls that are used in high-static applications or high-capacity coils.

The ECM is programmed with an algorithm that maintains a constant torque, as the static pressure on the system varies. For example, as the filter pressure drop increases due to dirt, the fan will increase speed (rpm) to maintain the cfm.

The ECM is identified by the two electrical receptacles located on the housing. See Fig. 17-23.

The first receptacle is a 5-row in-line connector that feeds the motor line voltage. This may be either 115 volts or 230 volts. Units that are wired for 230 volts have a jumper between terminals 1 and 2 on this plug (see wiring diagram).

The second receptacle on the motor is a 16-pin connector and is used for speed switching. This is a low voltage (24-volt) connection. There is a jumper wire between terminals 1 and 3. This is a 24-volt ground. Voltage is present at all times when the motor is energized.

**NOTE:** A time delay exists between the time the motor speed is switched and the motor's reaction. This is designed into the electronics and **does not** indicate motor problems.

When replacing the motor, note the following:

- Check the part number of the old motor against that of the replacement. There is a tag indicating the eight-digit part number and begins with UVE. This is the program number used for this motor.



- The motor must be installed per the instructions below. It is important to maintain the dimension between the fan compartment bulkhead and the coupling.

**IMPORTANT:** If a replacement cooling shroud has been supplied, it should be installed and the old one discarded. The motor shroud directs cooling air across the motor to provide proper cooling. Never run the motor without the cooling shroud in place. Ensure the shroud inlet ring does not touch the motor; a gap of  $\frac{1}{16}$  in. to  $\frac{1}{8}$  in. is acceptable.

#### **CAUTION**

Ensure the unit is completely assembled when checking the fan speed. Replace all panels, including the filters, before checking the fan for operation. When the internal pressure drops at a normal condition, the loading on the motor will be such that the fan can come up to selected speed.

Failure to ensure unit is completely assembled may result in reduced life of unit and/or personal injury.

To remove and re-install the motors, proceed as follows; refer Fig. 23:

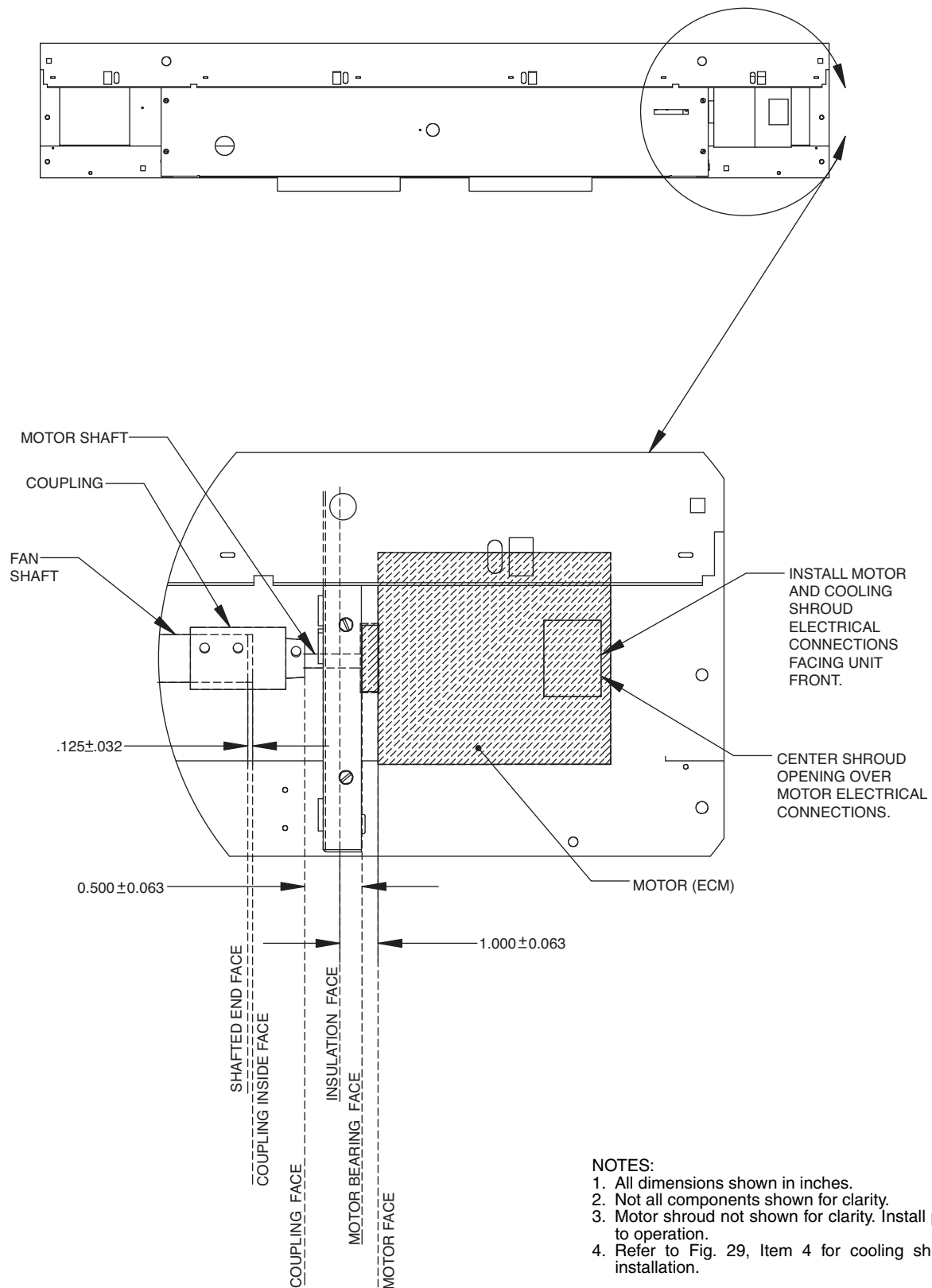
1. Remove the wire plugs from the motor.
2. Remove the 2 screws holding the motor shroud to the bulkhead.
3. Slide the shroud off the motor to the right.
4. Loosen the 3 setscrews on the shaft coupling between the motor shaft and the fan shaft.

5. Loosen the motor 'belly band' and slide motor out of the 'belly band' to the right. It is unnecessary to remove the motor mounting bracket from the bulkhead. Loosen only the 'belly band' securing the motor in the mount.
6. Reinstall the motor in the 'belly band.'
7. Ensure the blower wheels are centered within the fan housings (between the inlet rings) before securing the motor shaft coupling.

#### **CAUTION**

The motor electronics will fail prematurely if no air is able to circulate over the motor.

8. Ensure the motor housing is at least 1 in. from the bulkhead so that air will be able to circulate over the motor.
9. For vertical type units, position the motor so that the motor wire plugs are front facing on a horizontal plane. For horizontal type units with ceiling mounts, position the motor so that the motor wire plugs are front facing on a vertical plane.
10. Secure the 3 setscrews on the shaft coupling when the motor is properly positioned and the blower wheels are centered within their housing.
11. Re-secure the motor 'belly band' around the motor.
12. Reinstall the motor shroud. It is important that the motor shroud be installed prior to operation of the motor. Ensure the venturi is installed on the motor shroud.
13. Re-secure the two screws holding the motor shroud to the bulkhead.
14. Reinstall the motor wire plugs.



**Fig. 23 — 40UV,UH Ventilator Blower Section Assembly — ECM Motor Detail**

## Blower Assembly Section Removal and Reinstallation (Fig. 24)

### WARNING

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

### CAUTION

Be careful with all components during installation, especially the bearing and plastic blower wheels. Any extreme force applied to these components can cause unintended damage and void the unit warranty.

To remove blower assembly:

1. Turn off power to the unit.

**IMPORTANT:** Tag each right front panel (40UV) or middle bottom panel (40UH) for each unit. Panels have electrical information specific to each unit.

2. Remove all front (40UV) or bottom (40UH) panels. Remove end panels.
3. Remove top panel with  $\frac{5}{16}$  in. nut driver and set optional vanes and screens to the side (40UV). Remove ductwork if required and remove top (40UV) or front (40UH) discharge plenum.
4. Remove  $\frac{1}{4}$  in. head screws along length of unit that secure coil baffle to blower section. See Item 5 in Fig. 24.
5. Remove four  $\frac{1}{4}$  in. head screws that connect the blower section sides to the coil section sides. See Item 2 in Fig. 24.
6. Remove the  $\frac{1}{4}$  in. head screw from the center of the blower deck that attaches the blower deck to the pipe chase. See Item 1 in Fig. 24.
7. Remove six  $\frac{1}{4}$  in. head screws attaching coil baffle to coil section. See Item 4 in Fig. 24.
8. Remove the harness connector(s) from the motor.
9. Remove the  $\frac{1}{4}$  in. head screw from the green ground wire that connects the motor to frame if unit has a PSC (permanent split capacitor) motor. The ECM motors are grounded through the harness.
10. Remove the two carriage bolts retaining the front brace to the frame sides. See Item 6 in Fig. 24.
11. Remove the four nuts retaining the blower section to the back (40UV) or top (40UH) frame. See Item 3 in Fig. 24.

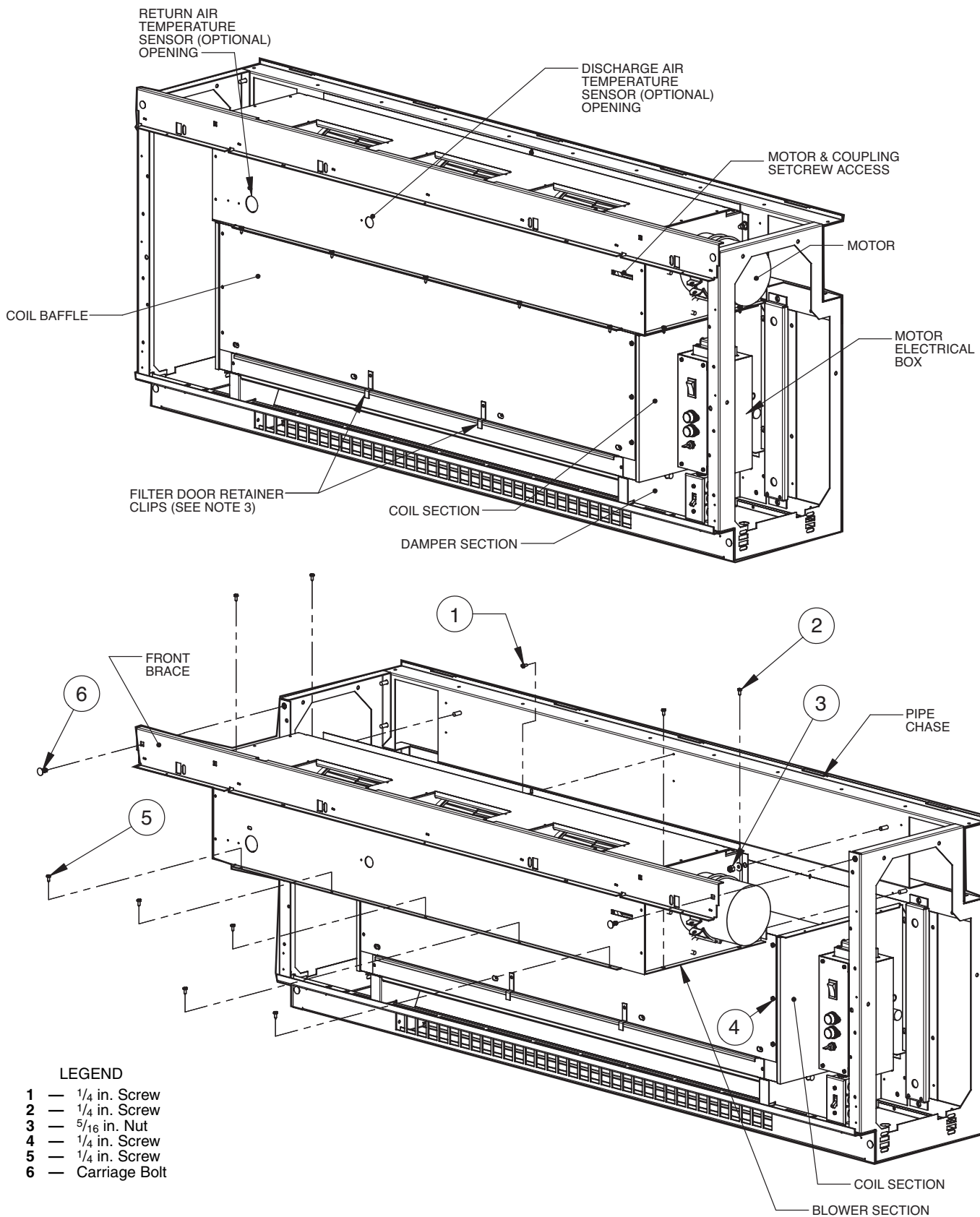
12. Remove the two  $\frac{5}{16}$  in. nuts retaining the inboard bearing bracket to the pipe chase (40UV, UH150 units only). See Item 6 in Fig. 25.

13. Remove blower section from frame.

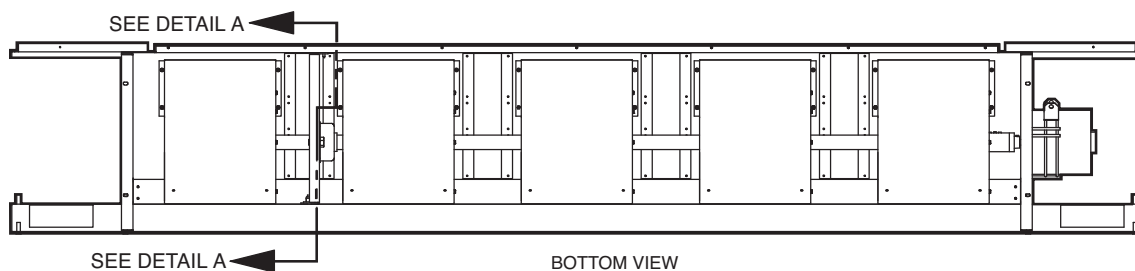
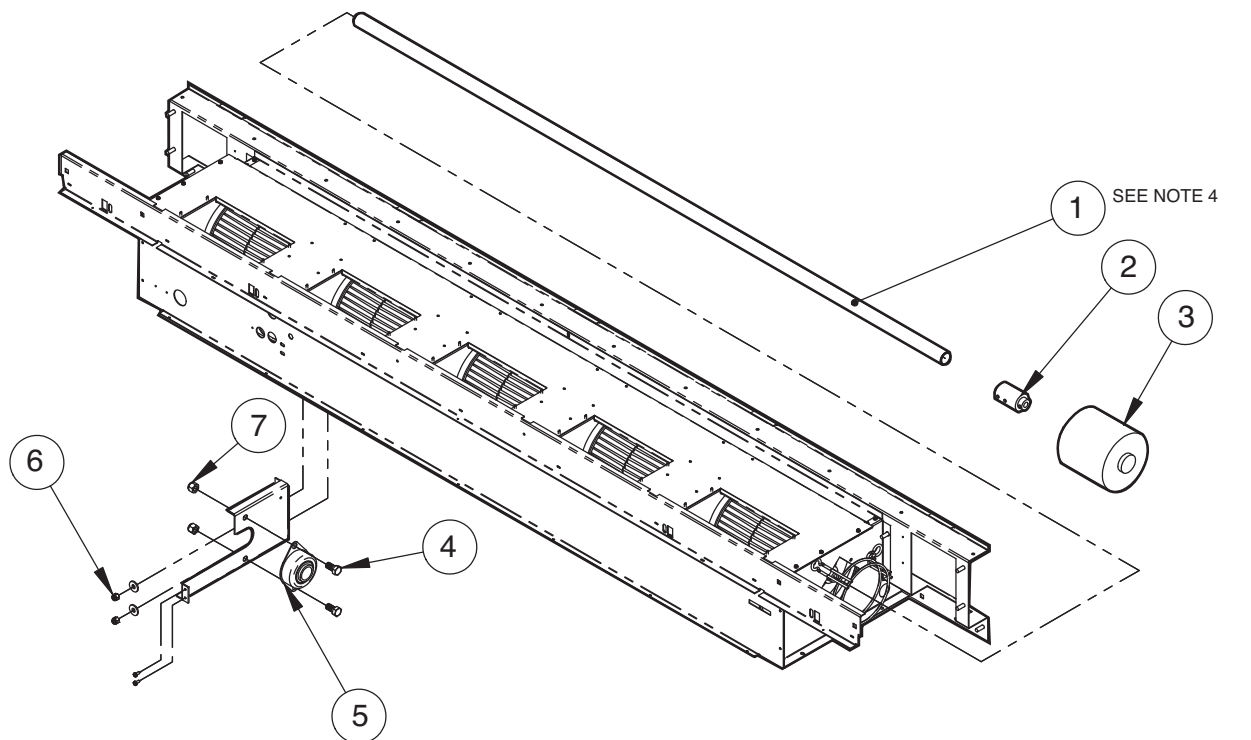
To reinstall blower assembly to frame of unit:

1. Reinstall blower section into frame assembly.
2. Tighten the four  $\frac{5}{16}$  in. nuts retaining blower section to frame. See Item 3 in Fig. 24.
3. Tighten the two  $\frac{5}{16}$  in. nuts retaining the inboard bearing bracket to the pipe chase (40UV, UH150 units only). See Item 6 in Fig. 25.
4. Reinstall two carriage bolts that attach the front brace to the frame sides. See Item 6 in Fig. 24.
5. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for any fan obstructions.
6. Re-attach green ground wire that connects the motor to the frame with  $\frac{1}{4}$  in. head screw if unit has a PSC motor. The ECM motors are grounded through the harness.
7. Connect harness connector(s) to motor.
8. Reinstall the coil baffle using six  $\frac{1}{4}$  in. head screws that attach the coil baffle to the coil section. See Item 4 in Fig. 24.
9. Reinstall the  $\frac{1}{4}$  in. head screw at center of blower deck attaching blower deck to pipe chase. See Item 1 in Fig. 24.
10. Reinstall the four  $\frac{1}{4}$  in. head screws holding the blower section sides to the coil section sides. See Item 2 in Fig. 24.
11. Reinstall  $\frac{1}{4}$  in. head screws along length of the unit, securing coil baffle to the blower section. See Item 5 in Fig. 24.
12. Reinstall optional vanes and screens and install top panel (40UV). Reinstall top (40UV) or front (40UH) discharge plenum and ductwork, if required.
13. Reinstall front (40UV) or bottom (40UH) panels. Reinstall end panels. **Ensure that tag on each right front panel (40UV) or middle bottom panel (40UH) matches unit tag.**
14. Restore power to unit.

**IMPORTANT:** Disassembly order is not as important as reassembly. The assembly order of the bearing bracket installation is critical to having a well balanced and sound blower deck.



**Fig. 24 — 40UV,UH Ventilator Blower Section**

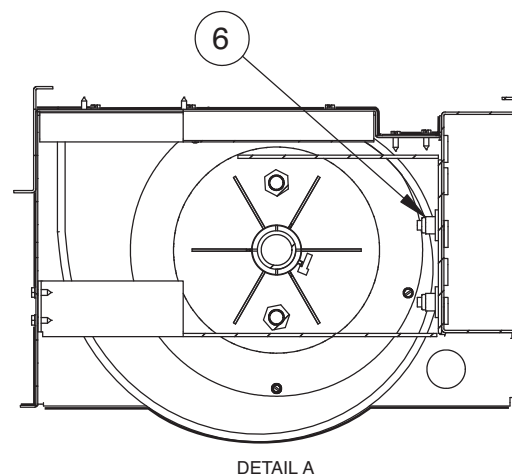


#### LEGEND

- 1 — Shaft
- 2 — Coupling
- 3 — Motor
- 4 — 1/2 in. Bolt
- 5 — Bearing
- 6 — 5/16 in. Nut
- 7 — Hex Nut

#### NOTES:

1. Not all components shown for clarity.
2. This drawing applies to 1500 cfm units only.
3. Remove shaft, motor, and coupling prior to bearing removal.
4. Refer to Fig. 23 and 30 for motor-coupling and coupling-shaft clearances.



**Fig. 25 — 40UV,UH Ventilator Inboard Bearing (40UV,UH150 Only)**

## Coil Assembly Removal and Reinstallation (Fig. 26)

### WARNING

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

### CAUTION

Turn off all power supplies to equipment and controls. Failure to do so may cause personal injury or damage to the unit.

To remove coil assembly:

1. Turn off power to the unit.

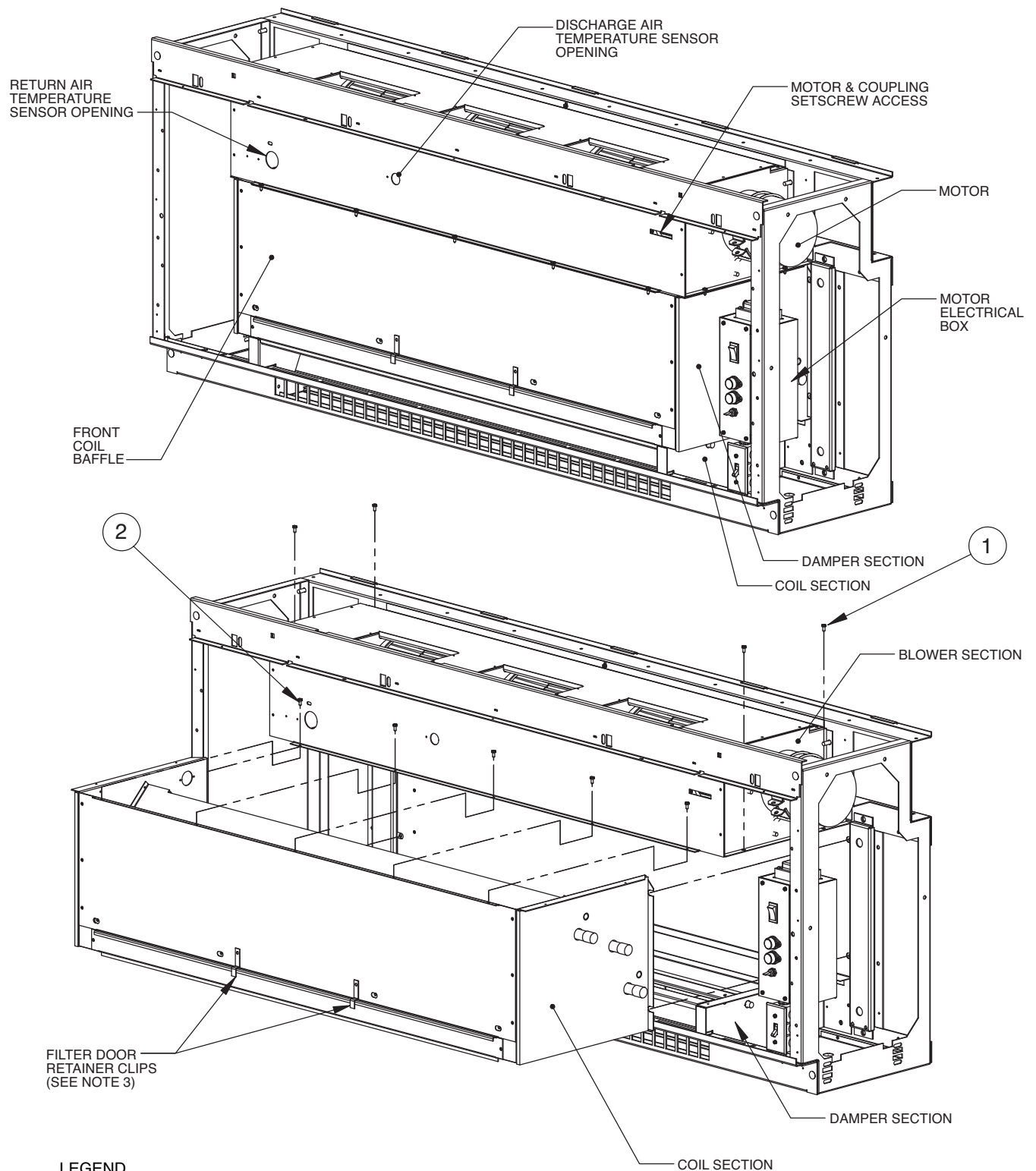
**IMPORTANT:** Tag each right front panel (40UV) or middle bottom panel (40UH) for each unit. Panels have electrical information specific to each unit.

2. Remove all front (40UV) or bottom (40UH) panels. Remove end panels.
3. Remove  $\frac{1}{4}$  in. head screws along length of unit that secure coil baffle to blower section. See Item 2 in Fig. 26.
4. Remove four  $\frac{1}{4}$  in. head screws that connect the blower section sides to the coil section sides. See Item 1 in Fig. 26.
5. Remove  $\frac{1}{4}$  in. head screws attaching outside air (OA) actuator to damper shaft OR locking quadrant assembly to damper shaft. Remove OA actuator or locking quadrant assembly.
6. Tag low-limit thermostat wiring and terminals. Disconnect low-limit thermostat wiring (right end compartment).
7. Drain water and/or recover refrigerant in accordance with all applicable codes. Disconnect piping from coil connections.

8. Tag optional electric heat element wire terminations for later reconnection. Disconnect element wires from electric heat control box (remove coil baffle for access).
9. Remove the four  $\frac{5}{16}$  in. nuts retaining the coil section to the frame.
10. Remove coil section from frame.

To reinstall coil assembly:

1. Replace coil section into frames assembly.
2. Tighten the four  $\frac{5}{16}$  in. nuts retaining coil section to frame.
3. Reconnect electric heat wiring in electric heat control box.
4. Reconnect wiring to low limit thermostat.
5. Replace the four  $\frac{1}{4}$  in. head screws holding the blower deck to coil section (two on each side).
6. Replace coil baffle using  $\frac{1}{4}$  in. head screws. See Item 2 in Fig. 26.
7. Reinstall outside air actuator or locking quadrant handle using  $\frac{1}{4}$  in. head screws.
8. Reconnect piping to coils. If water coil, purge air from coils and perform hydrostatic test to check for leaks. If DX coil, perform leak test using nitrogen, and evacuate and charge per recommended HVAC procedures and all applicable codes.
9. Replace coil section side insulation.
10. Replace front (40UV) or bottom (40UH) panels. Replace end panels. **Ensure that tag on each right front panel (40UV) or middle bottom panel (40UH) matches unit tag.**
11. Restore power to unit.



#### LEGEND

- 1 — 1/4 in. Head Screw
- 2 — 1/4 in. Head Screw

#### NOTES:

1. Unit shown in vertical orientation. Drawing applies to horizontal and vertical units.
2. Not all components shown for clarity.
3. 40UV,UH125-150, 40UH200 units only.

**Fig. 26 — 40UV,UH Ventilator Coil Section**



**Ball Bearing Replacement (40UV,UH150; 40UH200 Units Only)** — Refer to Fig. 27 for 40UH200 units only, Fig. 28 for 40UV150 and 40UH150 units with PSC motors, Fig. 29 for 40UV150 and 40UH150 units with ECM motors.

**⚠ WARNING**

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

**⚠ CAUTION**

The assembly order of the bearing installation is critical. Be careful with all components during removal and installation. Any excessive force applied to these components can cause unintended damage and void unit warranty.

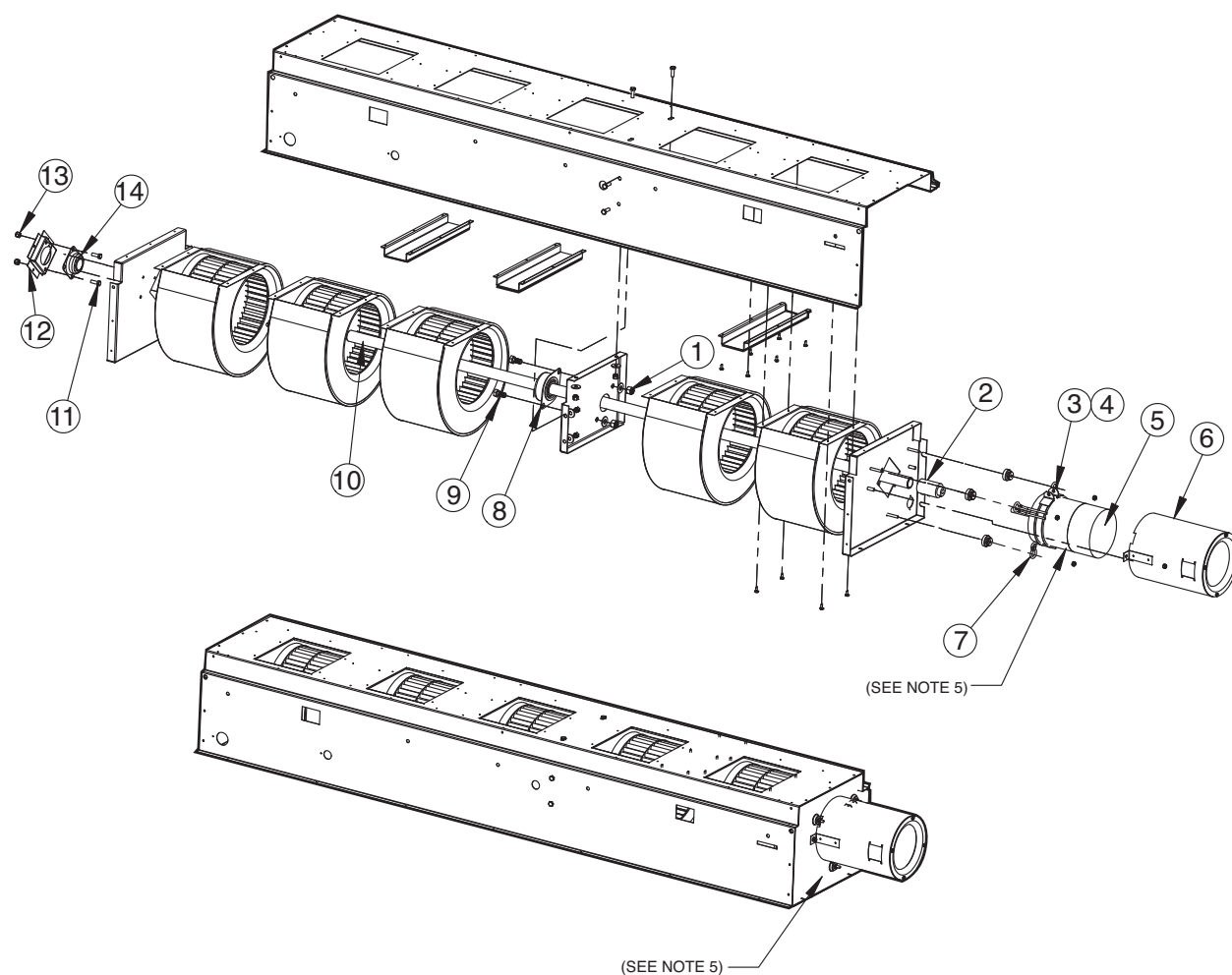
To replace ball bearing:

1. Turn off all power to unit.

**IMPORTANT:** Tag each right front panel (40UV) or middle bottom panel (40UH) for each unit. Panels have electrical information specific to each unit.

2. Remove front (40UV) or bottom (40UH) panels and right (motor end) end panel.
3. Remove top panel and set optional vanes and screens to the side (40UV). Remove ductwork if required and remove top (40UV) or front (40UH) discharge plenum. For non-ducted 40UH horizontal units with front double deflection discharge grille, remove grille for access to wheel setscrews. See Fig. 24.
4. Remove  $\frac{1}{4}$  in. head screws along length of unit that secure coil baffle to blower section and remove front coil baffle. See Item 5 in Fig. 24.
5. Loosen setscrews on all blower wheels (two per wheel). See Fig. 25 and Fig. 27.
6. Loosen bearing setscrews.
7. Remove wiring harness connector(s) from motor.
8. If unit has ECM motor, remove motor shroud (sheet metal cover — Fig. 27, Item 6; Fig. 29, Item 4) by removing two  $\frac{5}{16}$  in. hex nuts. **Do not discard cooling shroud.**
9. Loosen  $\frac{5}{16}$  in. motor mount (Fig. 27, Item 7; Fig. 28, Item 2; Fig. 29, Item 2), nut (Fig. 27, Item 3; Fig. 28, Item 5; Fig. 29, Item 6), and bolt (Fig. 27, Item 4; Fig. 28, Item 4; Fig. 29, Item 5), until motor housing (Fig. 27, Item 5; Fig. 28, Item 3; Fig. 29, Item 3) moves freely.
10. Slide shaft-coupling-motor assembly (Fig. 25, Items 3, 2, 1; Fig. 27, Items 5, 2, 10) out of wheels and unit until shaft clears inboard/center bearing assembly (30 in. max clearance required from edge of frame end).
11. Remove  $\frac{1}{2}$  in. bolts (Fig. 25, Item 4; Fig. 27, Item 9) and hex nuts (Fig. 25, Item 7; Fig. 27, Item 1) securing bearing to bearing bracket. Remove bearing (Fig. 25, Item 5; Fig. 27, Item 8).
12. Install new bearing (Fig. 25, Item 5; Fig. 27, Item 8). Secure with  $\frac{1}{2}$  in. bolts (Fig. 25, Item 4; Fig. 27, Item 9) and hex nuts (Fig. 25, Item 7; Fig. 27, Item 1).
13. Slide shaft-coupling-motor assembly (Fig. 25, Items 3, 2, 1; Fig. 27, Items 5, 2, 10) back into bearing and wheels. **Do not use excessive force. Damage to wheels may occur.**
14. Insert shaft-coupling-motor assembly into wheels until motor clearance is as specified for motor type (PSC or ECM). See Fig. 30 or Fig. 23.
15. Ensure that motor shaft is perpendicular to motor blower endplate. Tighten  $\frac{5}{16}$  in. motor mount (Fig. 27, Item 7; Fig. 28, Item 2; Fig. 29, Item 2), nut (Fig. 27, Item 3; Fig. 28, Item 5; Fig. 29, Item 6), and bolt (Fig. 27, Item 4; Fig. 28, Item 4; Fig. 29, Item 5), until motor (Fig. 27, Item 5; Fig. 28, Item 3; Fig. 29, Item 3) is secure.
16. Install motor shroud (sheet metal cover — Fig. 27, Item 6; Fig. 29, Item 4) using two  $\frac{5}{16}$  in. hex nuts if using ECM motor. Align “window” with receptacles on motor. **Motor control module could overheat and fail if operated without cooling shroud.**
17. Re-attach green ground wire that connects the motor to the frame with  $\frac{1}{4}$  in. head screw if unit has a PSC motor. The ECM motors are grounded through the harness.
18. Re-attach wiring harness connector(s) to motor.
19. Center each wheel in its respective housing and tighten wheel setscrews (two for each wheel).
20. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for any fan obstructions.
21. Remove lockout and operate unit for approximately 60 seconds to let inboard/center bearing mount self-adjust.
22. Lock out and tag all power supplies to equipment and controls. Tighten the two bearing setscrews.
23. Reinstall the coil baffle using the six  $\frac{1}{4}$  in. head screws that attach the coil baffle to the coil section. See Item 4 in Fig. 24.
24. Reinstall  $\frac{1}{4}$  in. head screws along length of unit securing coil baffle to the blower section. See Item 5 in Fig. 24.
25. Reinstall optional vanes and screens and install top panel (40UV). Reinstall top (40UV) or front (40UH) discharge plenum and ductwork if required or discharge grille.
26. Reinstall front (40UV) or bottom (40UH) panels. Reinstall end panels. **Ensure that tag on each right front panel (40UV) or middle bottom panel (40UH) matches unit tag.**
27. Restore power to unit.



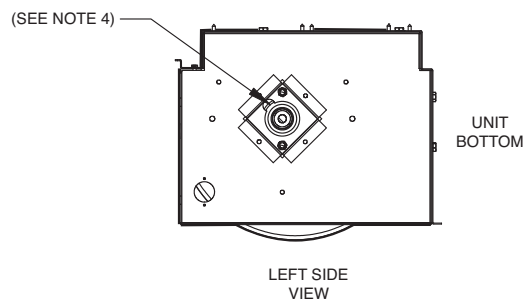


#### LEGEND

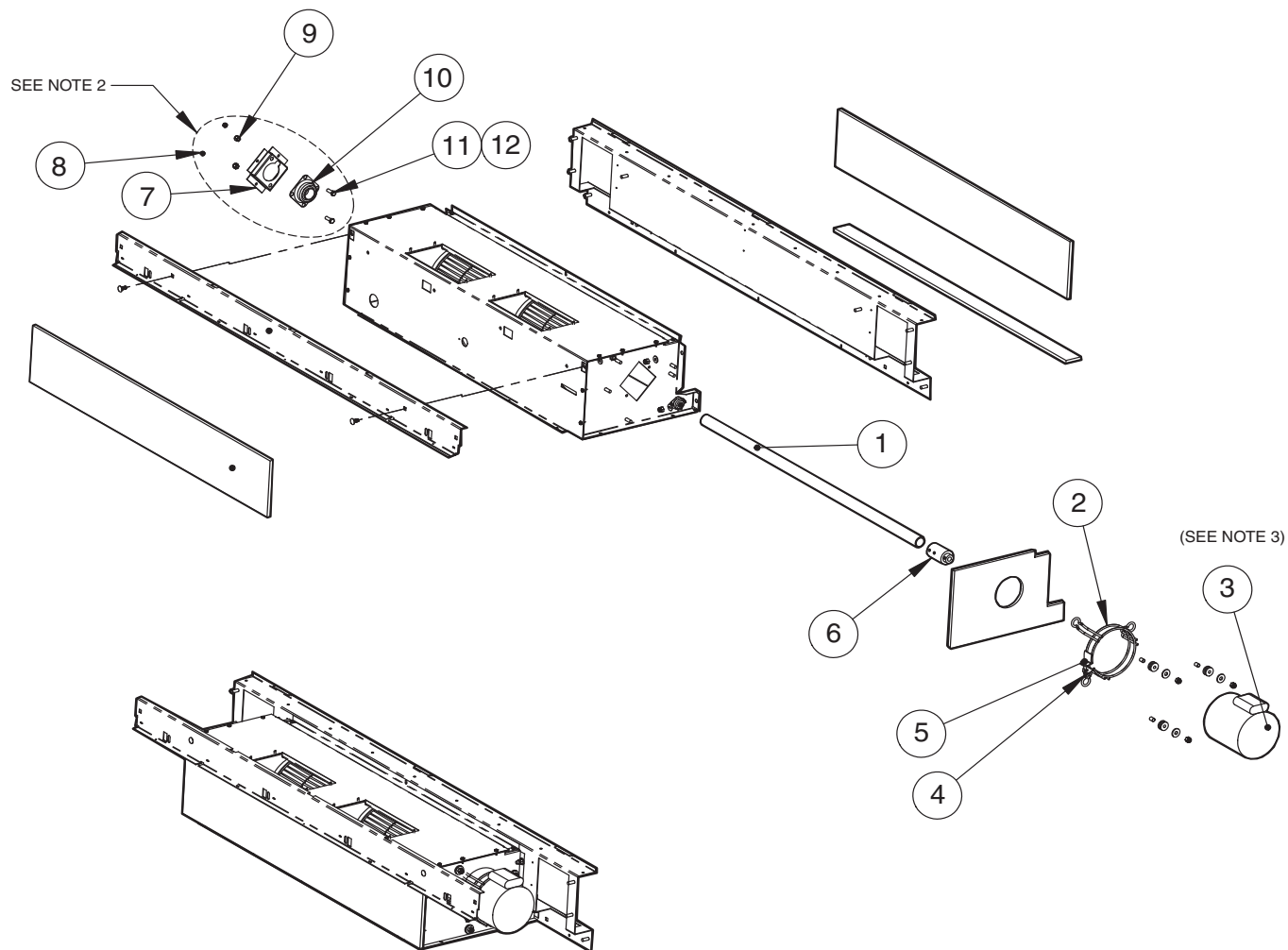
- 1 — Hex Nut
- 2 — Coupling
- 3 — Nut
- 4 — Bolt
- 5 — Motor Housing
- 6 — Motor Shroud
- 7 —  $\frac{5}{16}$  in. Motor Mount
- 8 — Bearing
- 9 —  $\frac{1}{2}$  in. Bolt
- 10 — Shaft
- 11 — Bolt
- 12 — End Bearing Bracket
- 13 — Hex Nut
- 14 — Holding Bearing

#### NOTES:

1. Not all components shown for clarity.
2. This drawing applies to 2000 cfm units only.
3. Remove shaft, motor and coupling prior to removing bearing. Refer to Removal and Reinstallation instructions.
4. Install sleeve bearing with oil cup facing up and towards the rear of the assembly.
5. Refer to Fig. 23 for motor-coupling and shaft-coupling tolerances.



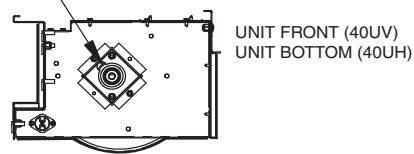
**Fig. 27 — 40UH200 Ventilator Blower Drive Train Assembly**



#### LEGEND

- 1 — Shaft
- 2 —  $\frac{5}{16}$  in. Motor Mount
- 3 — Motor Housing
- 4 — Bolt
- 5 — Nut
- 6 — Coupling
- 7 — End Bearing Bracket
- 8 — Hex Nut
- 9 — Hex Nut
- 10 — Holding Bearing
- 11 — Bolt
- 12 — Bearing Bracket Assembly

(SEE NOTE 4)

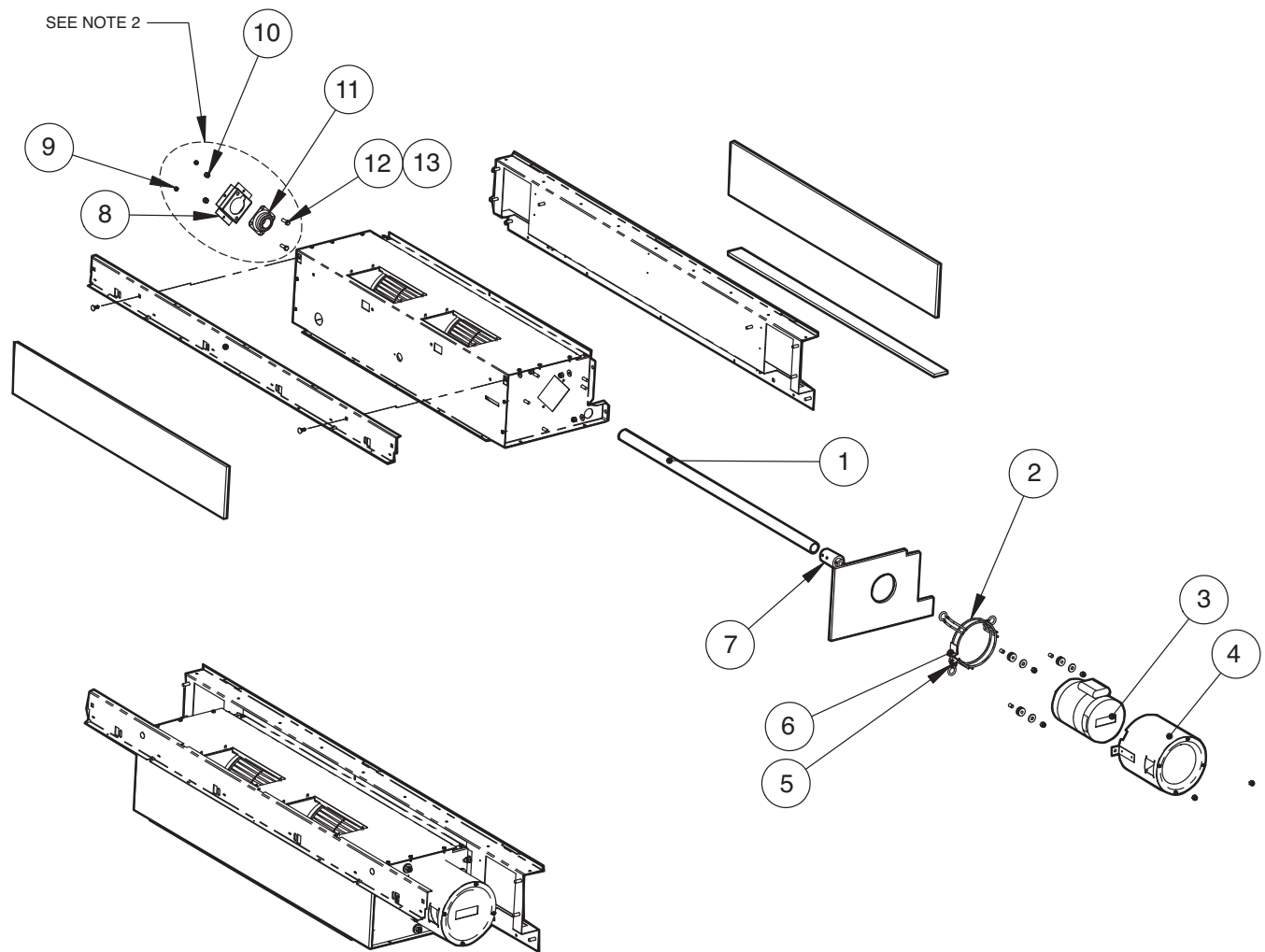


LEFT SIDE VIEW

#### NOTES:

1. Not all components shown for clarity.
2. Items no. 7, 10 and associated hardware not required for 40UV,UH150. Refer to Fig. 25 for 40UV,UH150 in-board bearing replacement.
3. Install motor with capacitor facing up.
4. Install sleeve bearing with oil cup facing up and towards the rear of the assembly.

**Fig. 28 — 40UV,UH Ventilator Blower Drive Train Assembly —  
40UV050-150 and 40UH075-150 Units (PSC Motor)**



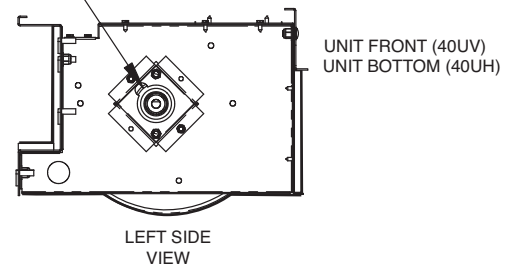
#### LEGEND

- 1 — Shaft
- 2 —  $\frac{5}{16}$  in. Motor Mount
- 3 — Motor Housing
- 4 — Motor Shroud
- 5 — Bolt
- 6 — Nut
- 7 — Coupling
- 8 — End Bearing Bracket
- 9 — Hex Nut
- 10 — Hex Nut
- 11 — Holding Bearing
- 12 — Bolt
- 13 — Bearing Bracket Assembly

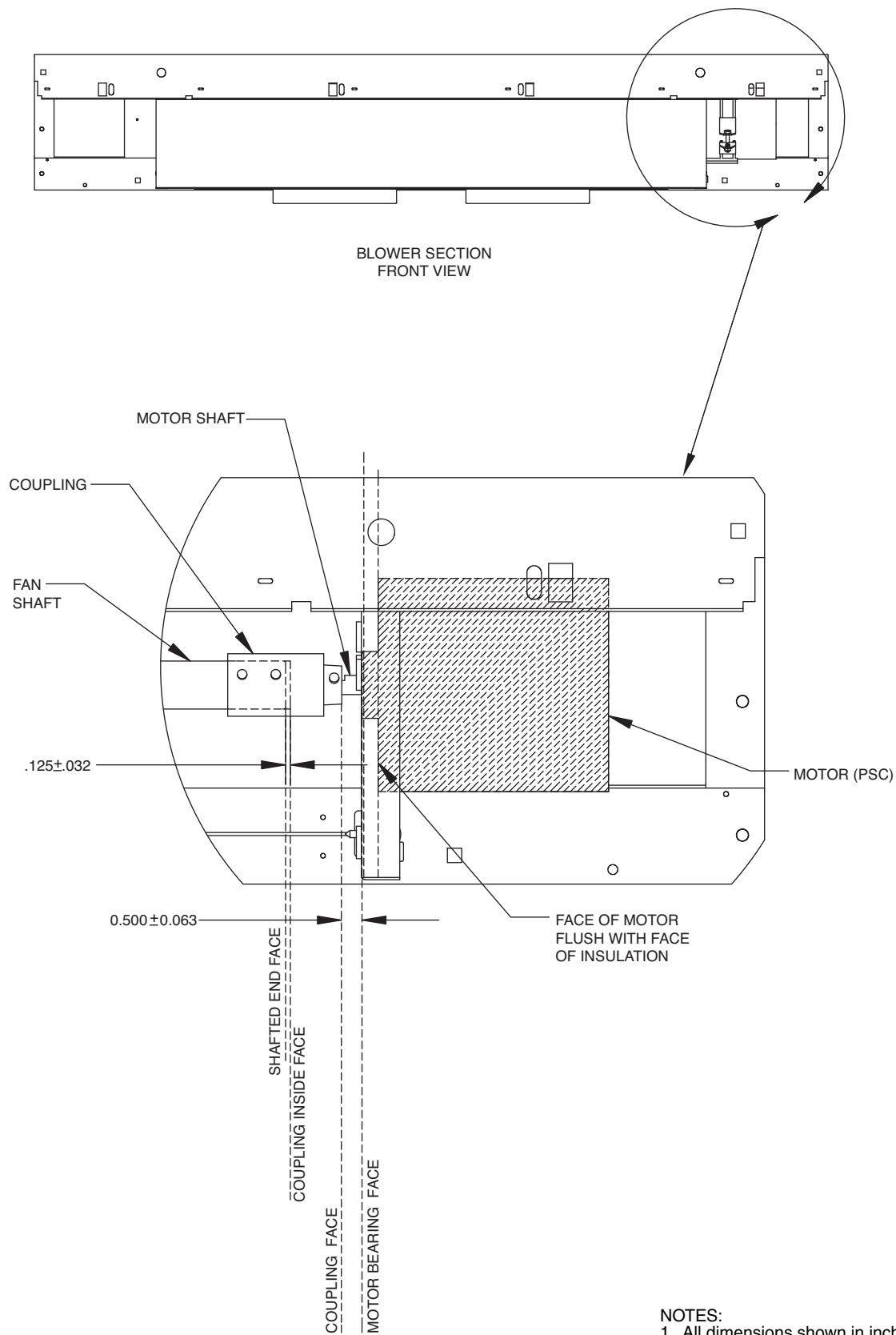
#### NOTES:

1. Not all components shown for clarity.
2. Items no. 8, 11 and associated hardware not required for 40UV,UH150. Refer to Fig. 25 for 40UV,UH150 in-board bearing replacement.
3. Install motor with electrical connections facing front of assembly.
4. Install oil cup facing up and towards the rear of the assembly.

(SEE NOTE 4)



**Fig. 29 — 40UV,UH Ventilator Blower Drive Train Assembly —  
40UV050-150 and 40UH075-150 Units (ECM Motor)**



**Fig. 30 — 40UV,UH Ventilator Blower Section Assembly — PSC Motor Detail**

**Sleeve Bearing Replacement (40UV050-125, 40UH075-125 and 40UH200 Units Only) (Fig. 31)** — Refer to Fig. 27 for 40UH200 units only, Fig. 28 for 40UV050-150 and 40UH075-125 units with PSC motors, Fig. 29 for 40UV050-125 and 40UH075-150 units with ECM motors.

**⚠ WARNING**

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

**⚠ CAUTION**

The assembly order of the bearing installation is critical. Be careful with all components during removal and installation. Any excessive force applied to these components can cause unintended damage and void unit warranty.

To replace ball bearing:

1. Turn off all power to unit.

**IMPORTANT:** Tag each right front panel (40UV) or middle bottom panel (40UH) for each unit. Panels have electrical information specific to each unit.

2. Use  $\frac{5}{32}$  in. hex (Allen) tool or  $\frac{3}{8}$  in. nut driver to remove front (40UV) or bottom (40UH) panels and right (motor end) end panel.
3. Remove  $\frac{1}{4}$  in. head screws (Item 5 in Fig. 24) along length of unit that secure coil baffle to blower section and remove front coil baffle.
4. Remove left blower section end (Item 2 in Fig. 31) insulation (Item 1 in Fig. 31).
5. Use  $\frac{7}{16}$  in. socket to remove hex nuts (Fig. 27, Item 13; Fig. 28, Item 8; Fig. 29, Item 9) securing end bearing bracket (Fig. 27, Item 12; Fig. 28, Item 7; Fig. 29, Item 8) to blower section end.
6. Remove bearing bracket assembly (Fig. 27, Items 12, 14, 13, 11; Fig. 28, Items 7, 10, 9, 11; Fig. 29, Items 8, 11, 10, 12) from blower section end. Use care to slide assembly

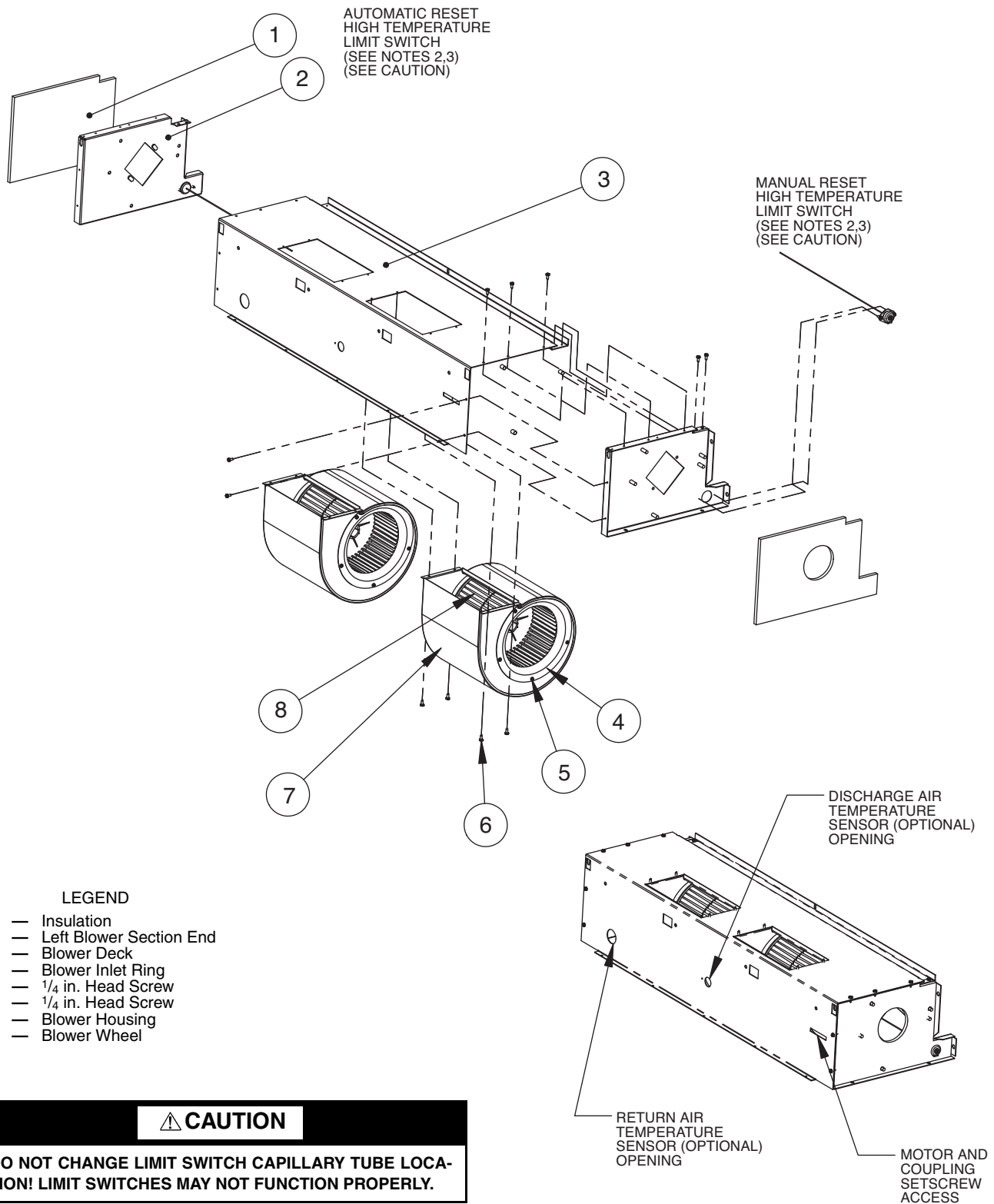
off of shaft end. **Hold shaft from inside blower section to prevent wheel damage.**

7. Use  $\frac{1}{2}$  in. socket and  $\frac{1}{2}$  in. combination wrench to remove hex nuts (Fig. 27, Item 13; Fig. 28, Item 9; Fig. 29, Item 10) and bolts (Fig. 27, Item 11; Fig. 28, Item 11; Fig. 29, Item 12) holding bearing (Fig. 27, Item 14; Fig. 28, Item 10; Fig. 29, Item 11) and bearing bracket (Fig. 27, Item 12; Fig. 28, Item 7; Fig. 29, Item 8) together.

**⚠ CAUTION**

Ensure sleeve bearing is installed with oil cup facing upwards as shown in left side view.

8. Replace bearing (Fig. 27, Item 14; Fig. 28, Item 10; Fig. 29, Item 11). Attach to bearing bracket using hex nuts and bolts. Align oil cup port with matching cutout in bearing bracket.
9. Use  $\frac{7}{16}$  in. socket to slide replacement bearing (Fig. 27, Item 14; Fig. 28, Item 10; Fig. 29, Item 11) on to the end of shaft and install bearing bracket assembly (Fig. 27, Items 12, 14, 13, 11; Fig. 28, Items 7, 10, 9, 11; Fig. 29, Items 8, 11, 10, 12) in blower section end. Attach using hex nuts.
10. Add 5 to 10 drops of SAE 20 or 30 non-detergent based oil to bearing.
11. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for any fan obstructions.
12. Reinstall left blower section end insulation (Item 1 in Fig. 31).
13. Reinstall  $\frac{1}{4}$  in. head screws (Item 5 in Fig. 24) along length of unit securing coil baffle to the blower section.
14. Reinstall front (40UV) or bottom (40UH) panels. Reinstall end panels. **Ensure that tag on each right front panel (40UV) or middle bottom panel (40UH) matches unit tag.**
15. Restore power to unit.



**Fig. 31 — 40UV,UH Ventilator Blower Section Assembly Sheet Metal (All Units)**

**Blower Wheel Removal and Reinstallation (Fig. 31)** — Refer to Fig. 27 for 40UH200 units only, Fig. 28 for 40UV050-150 and 40UH075-125 units with PSC motors, Fig. 29 for 40UV050-125 and 40UH075-150 units with ECM motors.

**⚠ WARNING**

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

**⚠ CAUTION**

The assembly order of the bearing installation is critical. Be careful with all components during removal and installation. Any excessive force applied to these components can cause unintended damage and void unit warranty.

To remove blower wheel:

1. Turn off all power to the unit.
2. Remove blower section per service instructions in Blower Assembly Section Removal and Reinstallation.

**IMPORTANT:** Tag each right front panel (40UV) or middle bottom panel (40UH) for each unit. Panels have electrical information specific to each unit.

3. Use  $\frac{5}{32}$  in. hex tool to loosen setscrews on all blower wheels (two per wheel).
4. Loosen inboard/center bearing setscrews (only on 40UV,UH150 and 200 size units).
5. If unit has ECM motor, remove motor shroud (sheet metal cover — Fig. 27, Item 6; Fig. 29, Item 4) by removing two  $\frac{5}{16}$  in. hex nuts. **Do not discard cooling shroud.**
6. Loosen  $\frac{5}{16}$  in. motor mount (Fig. 27, Item 7; Fig. 28, Item 2; Fig. 29, Item 2), nut (Fig. 27, Item 3; Fig. 28, Item 5; Fig. 29, Item 6), and bolt (Fig. 27, Item 4; Fig. 28, Item 4; Fig. 29, Item 5), until motor housing (Fig. 27, Item 5; Fig. 28, Item 3; Fig. 29, Item 3) moves freely.
7. Slide shaft-coupling-motor assembly (Fig. 25, Items 3, 2, 1; Fig. 27, Items 5, 2, 10) out of wheels and unit until shaft clears inboard/center bearing assembly (30 in. maximum clearance required from edge of frame end).
8. Remove four  $\frac{1}{4}$  in. head screws (Fig. 31, Item 6) securing blower housing(s) (Fig. 31, Item 7) to blower deck (Fig. 31, Item 3) and remove blower and wheel assembly.
9. Remove five  $\frac{1}{4}$  in. head screws (Fig. 31, Item 5) securing blower inlet ring (Fig. 31, Item 4) to blower housing and remove inlet ring.
10. Remove blower wheel(s) (Fig. 31, Item 8).

To reinstall blower wheel:

1. Install new blower wheel(s) (Fig. 31, Item 8). Ensure that the fan blades are installed in the correct orientation (cup of blade towards discharge).
2. Install inlet ring (Fig. 31, Item 4) and install five  $\frac{1}{4}$  in. head screws (Fig. 31, Item 5) securing blower inlet ring to blower housing (Fig. 31, Item 7).
3. Install four  $\frac{1}{4}$  in. head screws (Fig. 31, Item 6) securing blower housing(s) (Fig. 31, Item 7) to blower deck (Fig. 31, Item 3).

4. Slide shaft-coupling-motor assembly (Fig. 25, Items 3, 2, 1; Fig. 27, Items 5, 2, 10) back into bearing and wheels. **Do not use excessive force. Damage to wheels may occur.**
5. Insert shaft-coupling-motor assembly into wheels until motor clearance is as specified for motor type (PSC or ECM). See Fig. 30 or Fig. 23.
6. Ensure that motor shaft is perpendicular to motor blower endplate. Tighten  $\frac{5}{16}$  in. motor mount (Fig. 27, Item 7; Fig. 28, Item 2; Fig. 29, Item 2), nut (Fig. 27, Item 3; Fig. 28, Item 5; Fig. 29, Item 6), and bolt (Fig. 27, Item 4; Fig. 28, Item 4; Fig. 29, Item 5), until motor (Fig. 27, Item 5; Fig. 28, Item 3; Fig. 29, Item 3) is secure.
7. Install motor shroud (sheet metal cover — Fig. 27, Item 6; Fig. 29, Item 4) using two  $\frac{5}{16}$  in. hex nuts if using ECM motor. Align “window” with receptacles on motor. **Motor control module could overheat and fail if operated without cooling shroud.**
8. Reinstall blower section into frame assembly. See Fig. 24.
9. Tighten the four  $\frac{5}{16}$  in. nuts retaining blower section to frame.
10. Tighten the two  $\frac{5}{16}$  in. (Fig. 25, Item 6) nuts retaining the inboard bearing bracket to the pipe chase (only on 40UV,UH150 and 200 size units).
11. Reinstall two carriage bolts (Fig. 24, Item 6) that attach the front brace to the frame sides.
12. Re-attach green ground wire that connects the motor to the frame with  $\frac{1}{4}$  in. head screw if unit has a PSC motor. The ECM motors are grounded through the harness.
13. Re-attach wiring harness connector(s) to motor.
14. Center each wheel in its respective housing and tighten wheel setscrews (two for each wheel).
15. Reinstall one  $\frac{1}{4}$  in. head screw (Fig. 24, Item 1) at center of blower deck attaching blower deck to pipe chase.
16. Reinstall the four  $\frac{1}{4}$  in. head screws (Fig. 24, Item 2) holding the blower section sides to the coil section sides.
17. Rotate the fan shaft by hand to ensure that fans are unrestricted and can rotate freely. Check for any fan obstructions.
18. Remove lockout and operate unit for approximately 60 seconds to let inboard/center bearing mount self-adjust (only on 40UV,UH150 and 200 size units).
19. Lock out and tag all power supplies to equipment and controls. Tighten the two bearing setscrews (only on 40UV,UH150 and 200 size units). See Fig. 25, 27 or 31.
20. Reinstall the coil baffle using the six  $\frac{1}{4}$  in. head screws that attach the coil baffle to the coil section. See Item 4 in Fig. 24.
21. Reinstall  $\frac{1}{4}$  in. head screws along length of unit securing coil baffle to the blower section. See Item 5 in Fig. 24.
22. Reinstall optional vanes and screens and install top panel (40UV). Reinstall top (40UV) or front (40UH) discharge plenum and ductwork if required or discharge grille.
23. Reinstall front (40UV) or bottom (40UH) panels. Reinstall end panels. **Ensure that tag on each right front panel (40UV) or middle bottom panel (40UH) matches unit tag.**
24. Restore power to unit.



## Damper Section Removal and Reinstallation (Fig. 32)

### WARNING

Lock out and tag all power supplies to equipment and controls prior to servicing unit. Follow all safety codes. Failure to do so could result in personal injury.

### CAUTION

The assembly order of the bearing installation is critical. Be careful with all components during removal and installation. Any excessive force applied to these components can cause unintended damage and void unit warranty.

To remove damper section:

1. Turn off all power to unit.

**IMPORTANT:** Tag each right front panel (40UV) or middle bottom panel (40UH) for each unit. Panels have electrical information specific to each unit.

2. Use  $\frac{5}{32}$  in. hex (Allen) tool or  $\frac{3}{8}$  in. nut driver to remove front (40UV) or bottom (40UH) panels and right end panels.
3. Remove four carriage bolts and nuts securing kickplate to end frames.

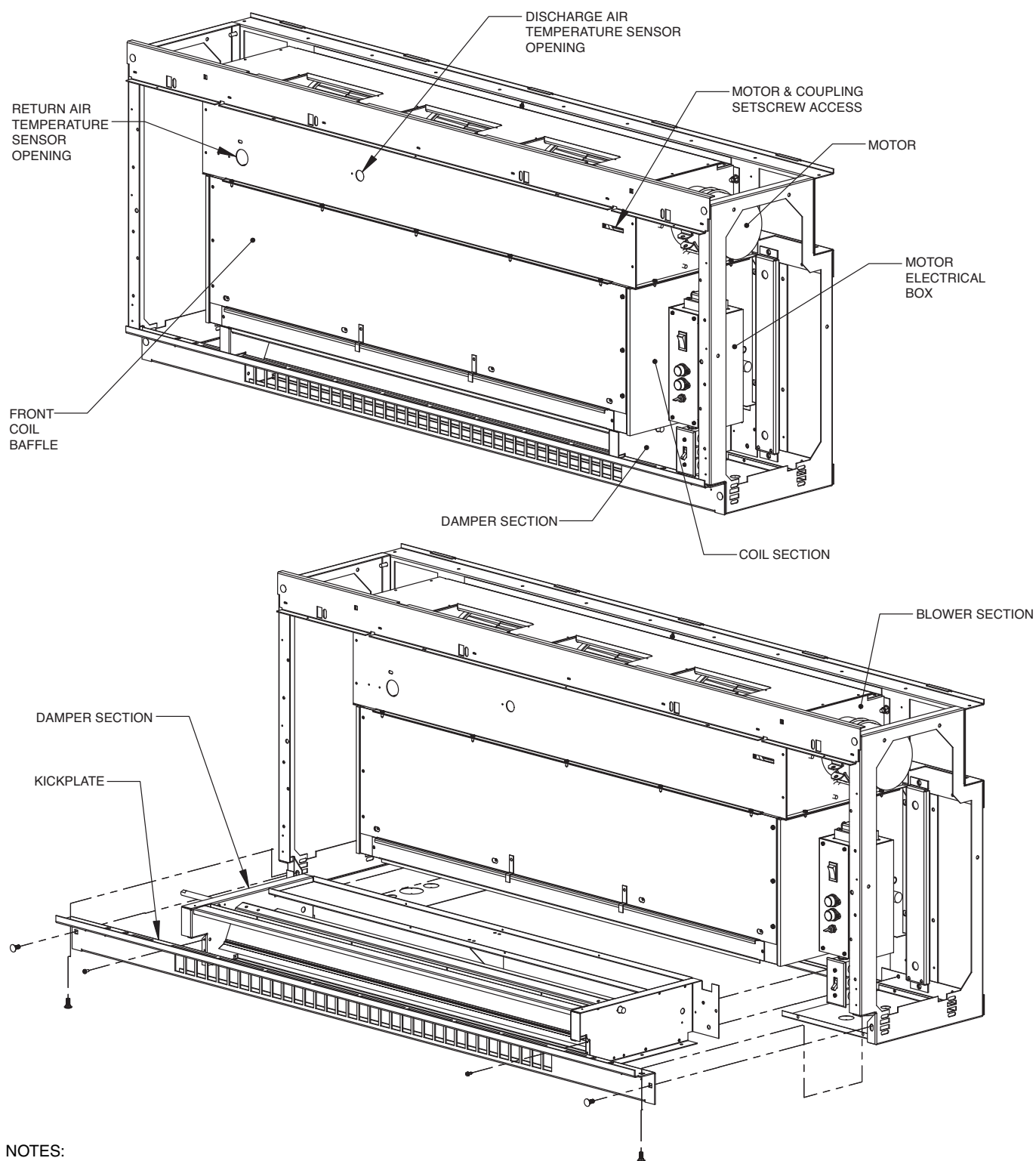
**IMPORTANT:** Tag kickplate for each unit. Kickplate has electrical information specific to each unit.

4. Remove the two  $\frac{1}{4}$  in. head screws securing kickplate to the damper sides (one on each side) and remove kickplate.
5. Remove  $\frac{1}{4}$  in. head screws attaching outside air (OA) actuator to damper shaft or attaching locking quadrant assembly to damper shaft. Remove OA actuator or locking quadrant assembly.
6. Remove six  $\frac{1}{4}$  in. head screws (3 per side) securing damper to 40UH unit rear panel.
7. Remove two  $\frac{5}{16}$  in. nuts attaching damper assembly to back frame.
8. Remove damper assembly from unit.

To replace damper section:

1. Replace damper assembly into unit.
2. Replace  $\frac{5}{16}$  in. nuts attaching damper assembly to back frame.
3. Replace six  $\frac{1}{4}$  in. head screws (3 per side) securing damper to 40UH unit rear panel.
4. Replace  $\frac{1}{4}$  in. head screws attaching OA actuator to damper shaft OR attaching locking quadrant assembly to damper shaft. Replace OA actuator or locking quadrant assembly.
5. Replace the two  $\frac{1}{4}$  in. head screws securing kickplate to the damper sides (one on each side) and remove kickplate.
6. Replace four carriage bolts and nuts securing kickplate to end frames.
7. Reinstall front (40UV) or bottom (40UH) panels. Reinstall end panels. **Ensure that tag on each right front panel (40UV) or middle bottom panel (40UH) matches unit tag.**
8. Restore power to the unit.





**NOTES:**

1. Unit shown in vertical orientation. Drawing applies to horizontal and vertical units.
2. Not all components shown for clarity.

**Fig. 32 — 40UV,UH Ventilator Damper Section Removal/Installation**





## UNIT START-UP CHECKLIST

MODEL NO.: \_\_\_\_\_ SERIAL NO.: \_\_\_\_\_  
SOFTWARE VERSION \_\_\_\_\_ TECHNICIAN: \_\_\_\_\_  
DATE: \_\_\_\_\_

### INITIAL CHECKLIST:

- ☐ DOES ELECTRICAL SERVICE CORRESPOND TO UNIT NAMEPLATE?
- ☐ ARE ALL ELECTRICAL CONNECTIONS TIGHT?
- ☐ DOES ALL FIELD WIRING CONFORM TO UNIT WIRING DIAGRAM?
- ☐ IS UNIT INSTALLED PER IOM (LEVEL, CABINET PAINT CONDITION ACCEPTABLE, ETC.)?
- ☐ IS THE CONDENSATE DISPOSAL SYSTEM OPERATING CORRECTLY?
- ☐ PROPER SLOPE OF FIELD REVERSIBLE DRAIN PAN?
- ☐ ARE END BEARING BOLTS ON FAN SHAFT TIGHT?
- ☐ ARE DAMPERS OPERATING PROPERLY?
- ☐ IS THE FILTER CLEAN?
- ☐ IS EXPANSION VALVE BULB PROPERLY INSTALLED AND INSULATED?

### PIPING CHECKLIST:

- ☐ IS EXPANSION VALVE BULB PROPERLY INSTALLED AND INSULATED?
- ☐ IS UNIT PIPING CORRECT AND INSULATED TO PREVENT CONDENSATION?
- ☐ ARE THE CONTROL VALVE PACKAGES PIPED CORRECTLY?
- ☐ ARE VALVE PACKAGES PROPERLY INSULATED?
- ☐ ARE THERE ANY LEAKS DETECTED?

### CONTROLS CHECKLIST:

- ☐ DOES THE UNIT HAVE CARRIER CONTROLS (CCN OR OPN)? IF SO, CONTINUE.
- ☐ CHECK THAT THE UNIT OPERATES PER SEQUENCE OF OPERATION AS STATED IN THE CONTROLLER IOM.
- ☐ RECORD THE THERMOSTAT READINGS IN TABLE BELOW.

| Please Fill Out the Following: | Reading |
|--------------------------------|---------|
| Controller Points              |         |
| Space Temperature              |         |
| Discharge Air Temperature      |         |
| Outdoor Air Temperature        |         |
| Outdoor Air Damper Position    |         |
| Set Points                     |         |
| Space Setpoint                 |         |
| Unoccupied Offset              |         |
| Minimum Position               |         |
| Deadband                       |         |
| Position (Open / Closed / %)   |         |
| Outdoor Air Damper             |         |
| Face/Bypass Damper             |         |